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PHASE I CULTURAL RESOURCES SURVEY AND ARCHEOLOGICAL INVENTORY OF THE PROPOSED CARROLLTON REVETMENT PROJECT, ORLEANS PARISH, LOUISIANA

VOLUME I of II

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NOVEMBER 2004

PREPARED FOR:

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
P.O. BOX 60267
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13. ABSTRACT *(Maximum 200 words)*

This document presents the results of an investigation completed by R. Christopher Goodwin & Associates, Inc., between August 11 and September 2, 2003, on behalf of the U.S. Army Corps of Engineers, New Orleans District. The proposed project area is located along the east-descending bank of the Mississippi River between River Mile 101.6 and 102.5 in Orleans Parish, Louisiana. The terrestrial portion of the proposed Area of Potential Effect encompassed an area that measured approximately 1.56 ha (3.86 ac) of land, while the submerged portion of the study area encompassed 11.1 ha (27.44 ac) in size. This undertaking incorporated in-depth historical research of the proposed project area and its surroundings; a detailed review of previously collected underwater remote sensing data provided by the U.S. Army Corps of Engineers, New Orleans District; and a Phase I cultural resources survey and archeological inventory of the terrestrial portion of the proposed Area of Potential Effect. All fieldwork was performed in accordance with the National Historic Preservation Act of 1966, as amended, and its implementing regulations as contained in 36 CFR Part 800 (Rev. 2001); The National Environmental Policy Act of 1969, as amended; *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983); and with the Scope of Work drafted by the U.S. Army Corps of Engineers, New Orleans District. During the current investigation, Site 16OR190 (Shipwreck #2), the submerged remains of the Eads-designed gunboat *Chickasaw,* was found to possess the qualities of significance as defined by the National Register criteria for evaluation (36 CFR 60.4 [a-d]). Site 16OR199 (Shipwreck # 11), the remains of the catamaran river ferry *A. M. Halliday*, was found to potentially possess those same qualities of significance. Because current project plans call for the emplacement of stone around and immediately adjacent to these two vessels, the proposed undertaking will have an effect on these two cultural resources. However, that effect, which will serve to alleviate scouring below the vessels and to stabilize them in place, will be beneficial to long term preservation. Therefore, the proposed undertaking will not have an adverse effect on historic properties. The New Orleans District should seek concurrence with the two aforementioned determinations of significance, and proceed with consultation on the application of the criteria of effect and the criteria of adverse effect with the Louisiana State Historic Preservation Officer (LASHPO). Based on the results of this Phase I cultural resources survey and/or analyses of the recovered data obtained from the terrestrial portion of the proposed project area, it was determined that no stratigraphically intact archeological deposits exist within this area. Thus, Site 16OR181 was found not to possess the qualities of significance as defined by the National Register criteria for evaluation (36 CFR 60.4 [a-d]). In addition, no historic standing structures were identified within the limits of the terrestrial portion of the proposed Carrollton Revetment project item. No additional testing of the terrestrial portion of the project area is recommended.

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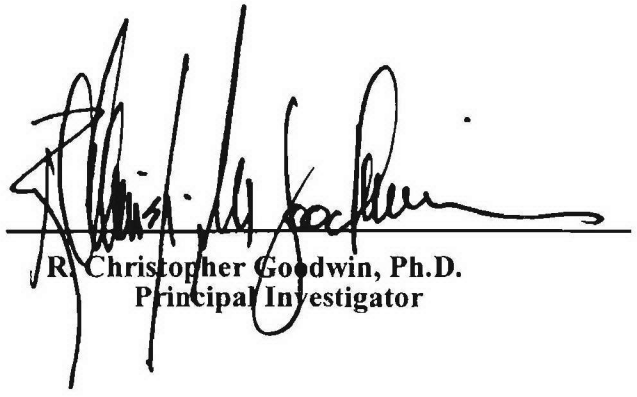
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Final Report

By

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CHAPTER I

INTRODUCTION

This document presents the results of a Phase I cultural resources survey and archeological inventory of the proposed Carrollton Revetment Project in Orleans Parish, Louisiana (Figure 1). This investigation was completed by R. Christopher Goodwin & Associates, Inc., between August 11 and September 2, 2003; it was conducted on behalf of the U.S. Army Corps of Engineers, New Orleans District, pursuant to Contract DACW29-01-D-0017, Delivery Order 0008. This undertaking incorporated in-depth historical research of the proposed project area and its surroundings; a detailed review of previously collected underwater remote sensing data provided by the U.S. Army Corps of Engineers, New Orleans District; and a Phase I cultural resources survey and archeological inventory of the terrestrial portion of the proposed Area of Potential Effect. All fieldwork was performed in accordance with the National Historic Preservation Act of 1966, as amended, and its implementing regulations as contained in 36 CFR Part 800 (Rev. 2001); the National Environmental Policy Act of 1969, as amended; *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983); and with the Scope of Work drafted by the U.S. Army Corps of Engineers, New Orleans District.

Project Background

The proposed project area is located along the left or east-descending bank of the Mississippi River between River Miles 101.6 and 102.5. The proposed revetment project is located within Section 14 of Township 13S, Range 10E in Orleans Parish, Louisiana, in an area of the city of New Orleans known as Greenville Bend (Figure 2). The proposed project reach encompasses an area that measures approximately 12.7 ha (31.3 ac) in size. Current construction plans call for the bankline in this area to be cleared of vegetation, graded to a uniform slope, and covered with stone to the edge of the Mississippi River. The plans also call for a section of the revetment to extend onto the bankline; however, the majority of the bankline will be used as a staging area for laying the underwater revetment within the project area.

The purpose of this investigation was to identify, inventory, and assess all cultural resources located within the terrestrial portion of the project area, and to synthesize and interpret the underwater remote sensing and historical data so that a series of recommendations could be made concerning the significance and minimization of impacts to submerged cultural resources during construction. To those ends, a detailed examination of the rich historical background of the immediate study area, and intensive archeological and remote sensing investigation of the Area of Potential Effect were performed.

The underwater portion of the project area was located exclusively within the Mississippi River; it measured approximately 768.5 m (2,521.3 ft) in length, and it ranged between approximately 128 and 155 m (420 and 508.5 ft) in width, depending on the width of the exposed shoreline at low tide. Water depth varied greatly across the Area of Potential Effect; however, it did not exceed a depth of 33.5 m (110 ft) below sea level. This portion of the proposed project area contained a minimum of 19 shipwrecks or abandoned vessels that were sunk or scuttled in the late nineteenth and twentieth centuries. Current use of the waterfront is commercial; this

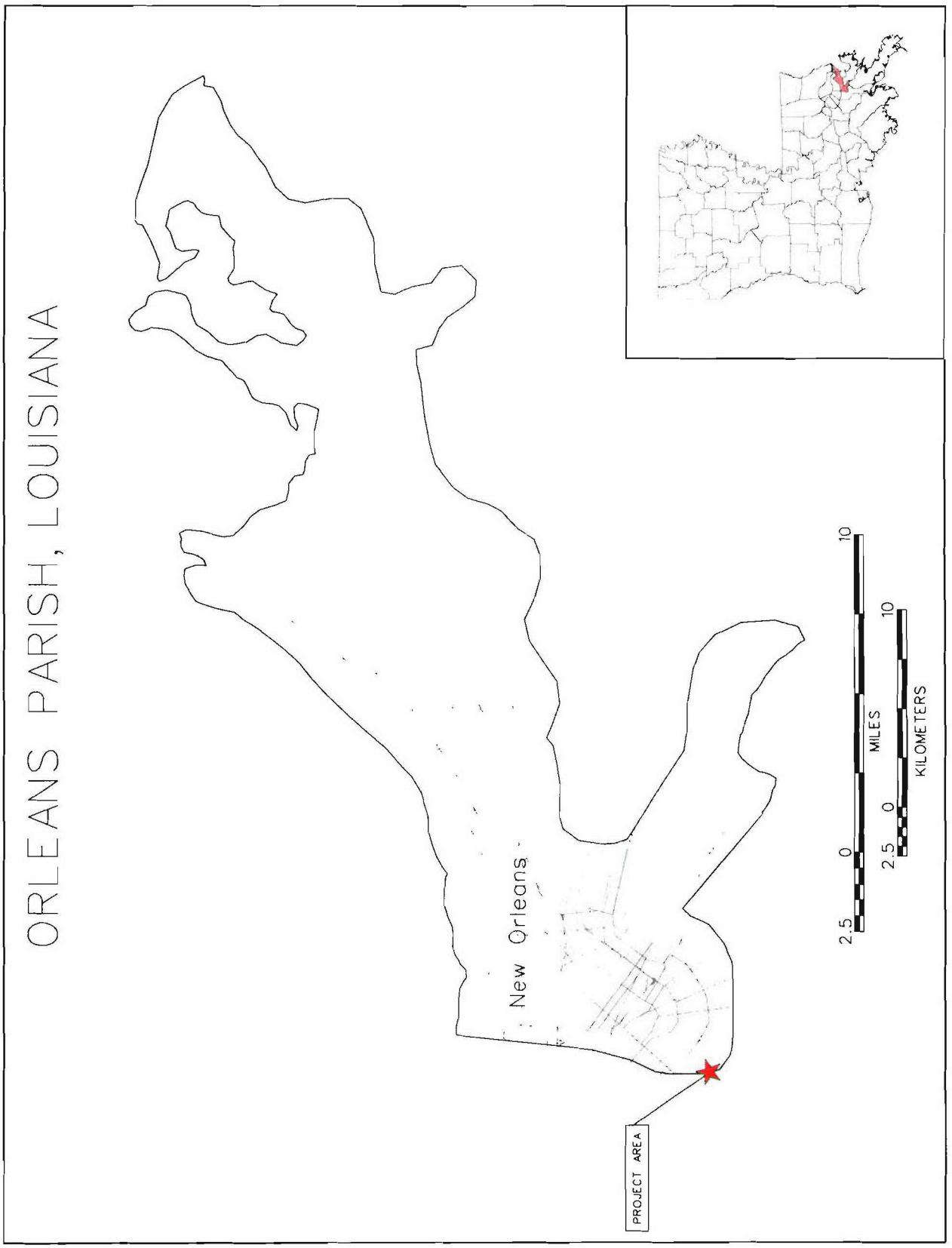


Figure 1. Location of the Carrollton Revetment Project Area within Orleans Parish, Louisiana.

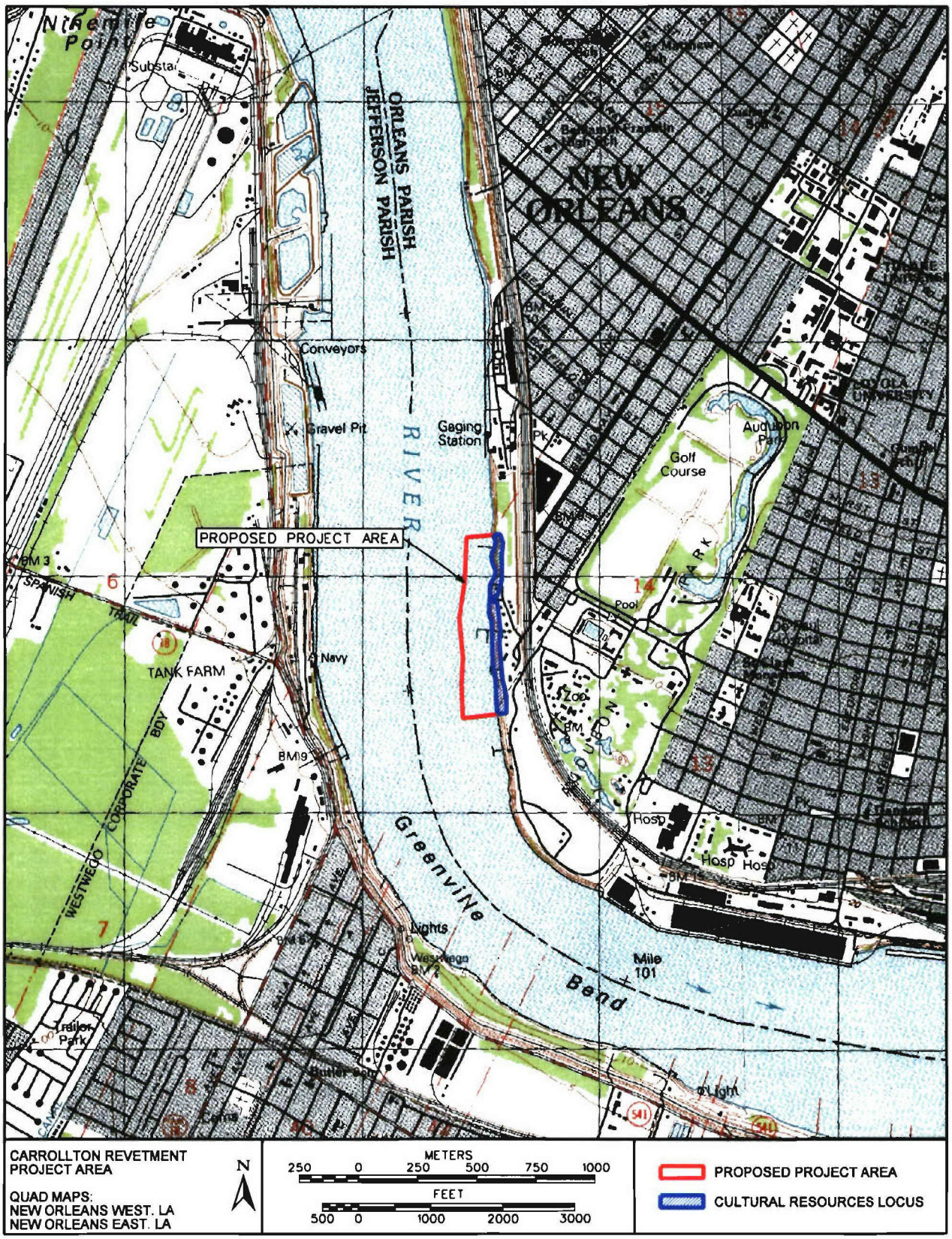


Figure 2. **An excerpt from the 1992 digital U.S. Geological Survey 7.5' New Orleans East and 7.5' New Orleans West, Louisiana topographic quadrangles depicting the location of the proposed Carrollton Revetment Project Area.**

portion of the Carrollton Revetment Project area is utilized as marine salvage and towboat facilities.

The terrestrial portion of the project area was located exclusively on the Mississippi River levee batture; it measured approximately 768.5 m (2,521.3 ft) in length, and it ranged between 10 and 37 m (32.8 and 121.4 ft) in width, depending on the width of the remaining bankline and the exposed shoreline. Vegetation within the terrestrial portion of the proposed project area consisted primarily of secondary growth, underbrush, and areas characterized by manicured lawn. The majority of the project area, however, contained graveled surfaces, debris, heavy equipment, riprap, and other erosion control measures. Current land use of the terrestrial portion of the proposed project area is commercial and public; seventy-five percent of the Carrollton Revetment Project area is utilized in operating marine salvage and towboat facilities, while the remaining twenty-five percent of the terrestrial portion of the project area consists of a public park.

Historical Research for the Project

A comprehensive literature, map, and records review specific to the study area was undertaken prior to the start of the current research effort. This included (1) review of all readily available historic maps and aerial photos depicting the Area of Potential Effect; (2) examination of local and regional historic archives and public records containing documents related to the proposed project reach; (3) review of cultural resources files maintained by the State of Louisiana, Department of Culture, Recreation, and Tourism, Division of Archaeology, including the National Register of Historic Places files maintained by the Division of Historic Preservation; (4) review of readily available geomorphologic data and reports that discuss the project vicinity, with an emphasis on historic and recent shoreline changes; (5) archival research dealing with waterborne commerce and transportation in the area; (6) interviews with local informants regarding the nature of the Area of Potential Effect, especially with the owner and personnel of the Bisso Marine Inc.; and (7) analysis of available photographs and archives to assist in the identification and documentation of high probability areas where cultural resources may be located.

A total of five major historical themes for the currently proposed project area stand out: the development of the Greenville neighborhood and the adjacent town of Carrollton; the founding of the Walnut Street Ferry inside the limits of the currently proposed Area of Potential Effect, which subsequently evolved into several independent Bisso family commercial entities; the creation, use, and expansion of the de Boré/Foucher plantation, which became Audubon Park; the reorganization of the area after the construction of the current levee, which was built between 1891 to 1893; and the importance of the Walnut Street Wharf as it relates to the maritime history of this portion of the Mississippi River.

In addition, historical data related to the types and dimensions of vessels that were utilized along this stretch of the Mississippi River were collected, interpreted, and synthesized. This effort was completed in order to formulate a "vessel typology" that could be used in the identification of submerged vessels documented during the review of previously collected remote sensing data. These data were examined to ascertain the nature of submerged historic watercraft located within the Area of Potential Effect, as well as to assess alterations that occurred as a result of post-depositional processes, including, but not limited to, channel migration and bank slumping. They also were employed in assessment of the significance of the submerged watercraft.

Results of Investigation and Recommendations

The underwater portion of this investigation included an examination of previously recorded multi-beam bathymetry and sidescan sonar records, as well as an examination of two vessels utilizing an acoustic camera. The analysis of remote sensing data resulted in the identification of 19 shipwrecks (Sites 16OR189 – 16OR207) within the channel of the Mississippi River (Table 1). Fieldwork conducted in association with the terrestrial portion of this survey included pedestrian survey augmented by the systematic excavation of both auger tests and backhoe trenches throughout the limits of the proposed project

Table 1. Submerged cultural resources identified during the analysis of the remote sensing data for the submerged portion of the Area of Potential Effect.

SITE NO.	SHIPWRECK NO.	VESSEL IDENTIFICATION	RIVER MILE	NORTHING (NAD 27)	EASTING (NAD 27)	NRHP ELIGIBILITY	RECOMMENDATIONS
16OR189	1	*Addison E. Bullard*	102.36	3314116	776490	Not Significant	No additional work
16OR190	2	*Chickasaw/ Gouldsboro*	102.36	3314103	776523	Potentially Significant	Archival and documentary research; public interpretation
16OR191	3	*Boaz*	102.34	3314061	776469	Not Significant	No additional work
16OR192	4	*Rooster/ Samson/ Napoleon*	102.33	3314060	776518	Not Significant	No additional work
16OR193	5	*Ajax*	102.29	3313987	776473	Not Significant	No additional work
16OR194	6	Unidentified Navy Patrol Craft	102.27	3313958	776455	Not Significant	No additional work
16OR195	7	*E.N.B. Barge 535*	102.2	3313855	776471	Not Significant	No additional work
16OR196	8	*Boswell/ Eclipse/ John S. Lanier*	102.2	3313862	776448	Not Significant	No additional work
16OR197	9	Unidentified New York Ferry/ Unidentified Tank Barge	102.2	3313854	776434	Not Significant	No additional work
16OR198	10	Unidentified Vessel	102.18	3313816	776441	Not Significant	No additional work
16OR199	11	*A.M. Halliday*	102.12	3313717	776479	Potentially Significant	Archival and documentary research; public interpretation
16OR200	12	Unidentified Vessel	102.03	3313572	776489	Not Significant	No additional work
16OR201	13	*Mary B.*	101.98	3313506	776492	Not Significant	No additional work
16OR202	14	*Tyler*	101.97	3313481	776470	Not Significant	No additional work
16OR203	15	Unidentified Landing Ferry	101.98	3313491	776418	Not Significant	No additional work
16OR204	16	Unidentified Vessel	101.97	3313476	776502	Not Significant	No additional work
16OR205	17	Unidentified Vessel	101.97	3313479	776520	Not Significant	No additional work
16OR206	18	Unidentified Vessel	101.95	3313449	776498	Not Significant	No additional work
16OR207	19	Unidentified Vessel	101.94	3313430	776477	Not Significant	No additional work

item. This latter effort resulted in the identification of a single archeological site (16OR181) during survey of the terrestrial component associated with this undertaking (Table 2).

Analysis of Remote Sensing Data and Identified Submerged Vessels

During the yearly Mississippi River low water period (November 2002), the U.S. Army Corps of Engineers, New Orleans District conducted a remote sensing survey of the Area of Potential Effect associated with the proposed Carrollton Revetment Project. This survey was performed using multi-beam bathymetry and sidescan sonar to identify any associated shipwrecks that may be located within the Area of Potential Effect. The primary instrument utilized during completion of the survey was a multi-beam system; it was employed to create a high-resolution bathymetric map of the river bottom. In addition, a sidescan sonar survey of the proposed project area was completed as a secondary check of the bathymetric data. It also was employed to assist in identification of the possible shipwrecks noted within the study area during the previously completed bathymetric survey.

In addition, in September of 2003, the U.S. Army Corps of Engineers, New Orleans and Vicksburg Districts jointly performed a survey of the underwater portion of the proposed project area utilizing a high-resolution acoustic imaging system developed by the Applied Physics Laboratory. The goal of this investigation was to obtain detailed images of various features of the shipwrecks that could be used in archeological analysis and identification of the submerged tar-

Table 2. Cultural resources identified during Phase I terrestrial cultural resources survey and archeological inventory.

SITE NO.	PARISH	USGS 7.5' QUAD	UTM COORDINATES	SITE SIZE (ha/ac)	DESCRIPTION AND DATE RANGE	NRHP STATUS
16OR181	Orleans	New Orleans West, La	N3313780 E776560	1.56 ha (3.86 ac)	Nineteenth to twentieth century artifact scatter	Not Significant

gets in question; i.e., obtaining clear images of specific deck machinery, hull profiles, or hardware that could aid in assigning the shipwrecks to a known vessel of a specific time period.

Despite the shortcomings of the previously recorded remote sensing data, analysis of this dataset resulted in the identification 19 shipwrecks (Sites 16OR189 – 16OR207); these vessels were lost or scuttled in the area during the late nineteenth to mid twentieth centuries (Table 1). In addition, several vessels could not be documented fully due to the lack of coverage of the multi-beam data, or to issues associated with the side scan sonar tow fish geometry in relation to the Mississippi River bottom.

Recommendations for the Submerged Portion of the Area of Potential Effect

During the current investigation, Sites 16OR190 and 16OR199 (Shipwrecks #2 and 11), the submerged remains of the Eads-designed gunboat *Chickasaw* and of the catamaran river ferry *A. M. Halliday*, were found to possess the qualities of significance as defined by the National Register criteria for evaluation (36 CFR 60.4 [a-d]). The New Orleans District should consult with the Louisiana SHPO to obtain concurrence in these determinations of significance, and in the application of the criteria of effect and of adverse effect. A determination of no adverse effect is recommended; in the event that the Louisiana SHPO concurs in this assessment, the New Orleans District should follow the procedures outlined at 36 CFR 800.5 (c)(1).

Analysis of the remote sensing data, diver investigation, historic documentation, and oral history allowed for the identification of the other 17 vessels, i.e., Sites 16OR189, 16OR191 - 16OR198 and 16OR200 - 16OR207 (Shipwrecks #1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, and 19). These data have shown that these submerged watercraft represent common vessel types that remain in service on the Mississippi and other western rivers today, that have lost their integrity due to demolition and/or refits, that are not associated with any significant historical event or personage, that are examples of types that are well documented, that are modern, or that lack research potential. Sites 16OR189, 16OR191 - 16OR198, and 16OR200 - 16OR207 (Shipwrecks #1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, and 19) are not significant applying the criteria for evaluation (36 CFR 60.4 [a-d]). No additional work is recommended for these vessels.

Methods and Results of Terrestrial Survey

To facilitate management of fieldwork for the terrestrial portion of the project, the Area of Potential Effect was divided into four survey areas that corresponded with current property boundaries (Figure 3; Table 3). This investigation identified the portion of Audubon Park known locally as the "Butterfly," as Area A. Area B was that portion of the Area of Potential Effect situated within the Bisso Towboat Company, Inc. property. It was flanked by Area A to the south and by E.N. Bisso and Son, Inc. (i.e., Area C), to the north. E.N. Bisso and Son, Inc. (Area C) was bounded to the north by the property of Bisso Marine Inc., and to the south by Area B. Finally, the largest property situated within the project area, Bisso Marine Inc., was identified as Area D; it was situated between Area C and the headquarters buildings of the U.S. Army Corps of Engineers, New Orleans District.

Fieldwork in these areas consisted of pedestrian survey, augmented by systematic auger testing throughout the entire length and width of proposed project item. In addition, backhoe trenching was performed throughout selected areas of the Area of Potential Effect that were clear of vegetation. A detailed topographic map also was made of the levee and the batture

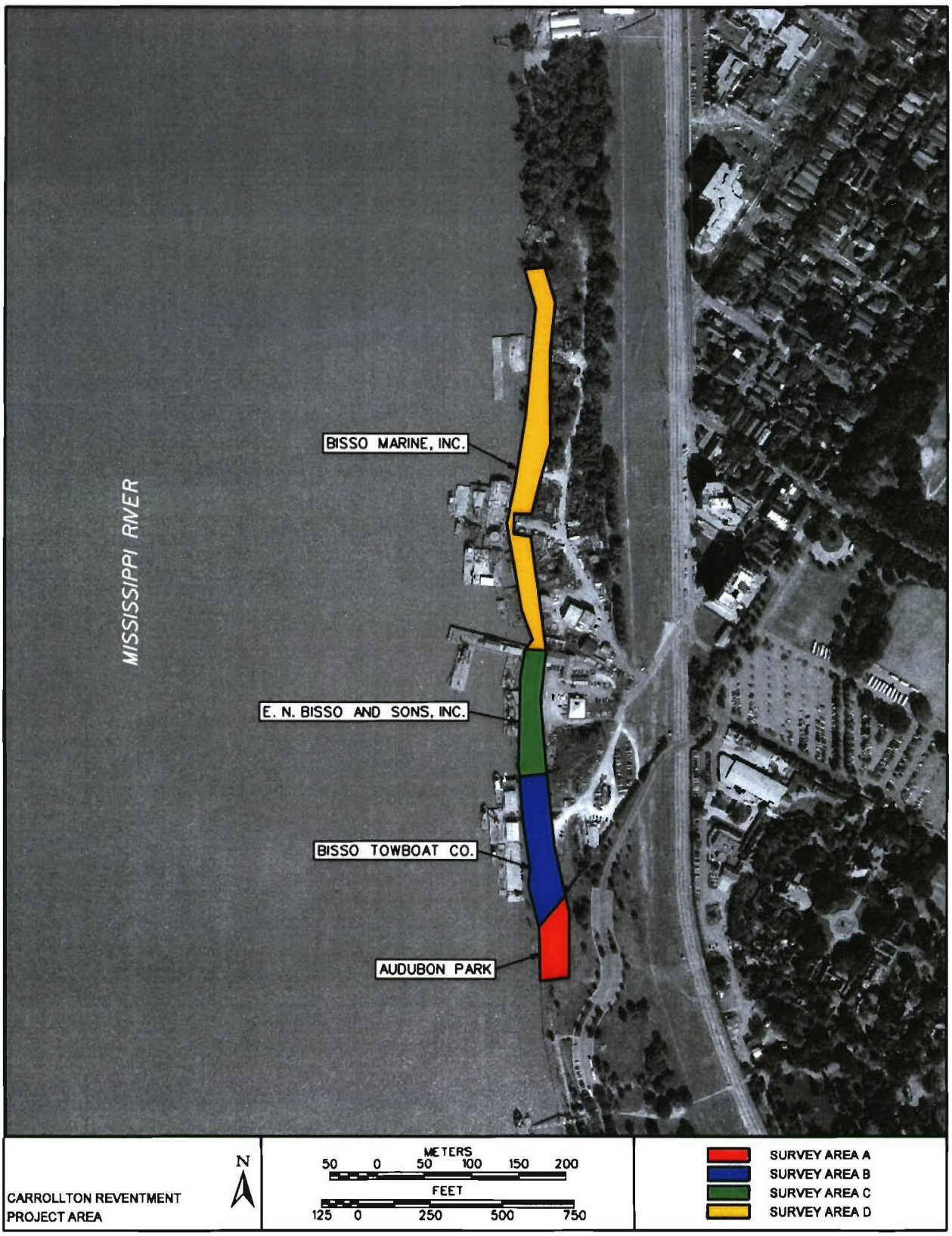


Figure 3. **Aerial overview of the Carrollton Revetment Project Area depicting the four survey areas.**

Table 3. Breakdown of the four areas surveyed during the Phase I cultural resources survey and archeological inventory of the terrestrial portion of the Area of Potential Effect.

AREA	PROPERTY OWNER	HECTARE (ACRE)	AUGER TESTS		BACKHOE TRENCHES		ARTIFACTS RECOVERED
			Excavated	Planned	Excavated	Planned	
Area A	Audubon Park	0.18 ha (0.44 ac)	1	1	4	4	Material collected during pedestrian survey and subsurface testing
Area B	Bisso Towboat Company	0.53 ha (1.3 ac)	16	16	8	8	Material collected during pedestrian survey and subsurface testing
Area C	E.N. Bisso and Son, Inc.	0.2 ha (0.52 ac)	17	18	0	0	None Identified
Area D	Bisso Marine Inc.	0.64 ha (1.6 ac)	22	27	0	0	Material collected during pedestrian survey

in the vicinity of the proposed project area. In addition to pedestrian survey, subsurface investigations, and topographic mapping, an architectural review was conducted in order to identify any standing structures older than 50 years within or adjacent to the study area. However, no historic standing structures were identified during this survey.

During survey, a total of 56 auger tests and 12 backhoe trenches were excavated successfully throughout the Area of Potential Effect. Backhoe trenching and auger testing within the Area of Potential Effect confirmed the presence of between 2.6 and 5.8 m (8.5 and 19 ft) of fill throughout the proposed project area. Cultural material was recovered from the surface of each survey area, except for Area C; thus, the entire terrestrial portion of the Area of Potential Effect was identified and recorded as Site 16OR181. However, visual reconnaissance and/or subsurface testing of the proposed project area did not result in the identification of any intact cultural deposits; the only temporally diagnostic artifacts were collected from fill deposits that have been modified and redeposited through the years. Therefore, Site 16OR181 was found not to possess the qualities of significance as defined by the National Register of Historic Places criteria of evaluation (36 CFR 60.4 [a-d]).

Recommendations for the Terrestrial Portion of the Area of Potential Effect

Based on the results of this Phase I cultural resources survey and/or analyses of the recovered data obtained from the terrestrial portion of the proposed project area, it was determined that no stratigraphically intact archeological deposits exist within this area. Thus, Site 16OR181 was found not to possess the qualities of significance as defined by the National Register criteria for evaluation (36 CFR 60.4 [a-d]). In addition, no historic standing structures were identified within the limits of the terrestrial portion of the proposed Carrollton Revetment project item. No additional testing of the terrestrial portion of the project area is recommended.

Project Personnel

Dr. R. Christopher Goodwin, Mr. William P. Athens, M.A., R.P.A., and Mr. David George, M.A., R.P.A., acted as Co-Principal Investigators and supervised all aspects of this study. Ms. Kari Krause, M.S., R.P.A., served as Project Manager. Ms. Katy Coyle, M.A., and Dr. Samuel Turner, performed all aspects of the historical background research for the project area. Mr. Jean B. Pelletier, M.A., interpreted the remote sensing data provided by the U.S. Army Corps of Engineers, New Orleans District, including the multi-beam and side-scan sonar data of the bottom of the Mississippi River as it extends through the Area of Potential Effect. Mr. Jeremy Pincoske, B.A. contributed to the previous investigations section of the report. Ms. Marie Pokrant, M.A., R.P.A., served as the Assistant Project Manager, and she directed all aspects of the field operations as they pertained to the terrestrial portion of the project area. Ms. Ashley

Sanders, B.A., Ms. Heather Childers, B.S., Ms. Carrie Humphrey, B.A., Mr. Peter Cropley, B.A., and Ms. Danielle Wheeler, B.A. assisted her in the field. Ms. Heather Backo, M.A., and Ms. Marie Pokrant, M.A., R.P.A., conducted the laboratory analyses of all of the recovered material. Mr. David Stitcher, B.A., Ms. Heather Childers, B.S., Mr. Timothy Goddard, B.A., and Mr. Barry Warthen, B.A., prepared the graphics that appear in this document. Ms. Heidi Post, B.A., produced this report. Resumes of key project personnel are appended to this document.

Organization of the Report

The natural setting of the proposed project reach is described in Chapter II, which includes a brief overview of the geomorphology, soils, flora, fauna, and climate of the region. The prehistory of the study area and the surrounding region is outlined in Chapter III. The history of the project area is chronicled in Chapter IV. This chapter describes general history of the region, the comprehensive literature, map, and records review of the proposed project item. Chapter V chronicles the history of waterborne commerce and transportation in the area. It also synthesizes historical data related to the types and dimensions of vessels that were utilized along this stretch of the Mississippi River, creating a vessel typology that was used in the identification of submerged watercraft documented within the Area of Potential Effect. Chapter VI provides a review of all previously recorded archeological sites, previously recorded historic period standing structures, and previously completed cultural resources surveys in the vicinity of the proposed project item. The methods used in the analysis of the remote sensing data provided by the U.S. Army Corps of Engineers, New Orleans District, as well as the field methods used to complete the Phase I survey of the terrestrial portion of this investigation, are discussed in Chapter VII. That chapter also includes a discussion of laboratory methods and procedures used to process and analyze cultural materials recovered during survey.

Chapter VIII presents the results of this Phase I cultural resources survey and archeological inventory of the Carrollton Revetment project area. This chapter discusses the interpretation of the underwater remote sensing data, including the identification of acoustic anomalies based on expectations of the character (i.e., signatures) of shipwrecks derived from the available literature, interviews with local informants, and the experience of our project personnel. The results of the terrestrial portion of the Phase I survey also are described in Chapter VIII. A summary and management recommendations are contained in the final chapter. A list of artifacts recovered as a result of these investigations is included as Appendix I, while Appendix II contains Louisiana State Site Forms. Finally, correspondence with the Louisiana Division of Archaeology appears in Appendix III.

CHAPTER II

NATURAL SETTING

Project Area Location

The proposed project area is located along the east-descending bank of the Mississippi River between River Mile 101.6 and 102.5. It is located in Orleans Parish, Louisiana, in an area of the city of New Orleans known as Greenville Bend (Figure 2). The terrestrial portion of the Area of Potential Effect measures approximately 620 m (2,034 ft) in length by 10 to 22 m (32.8 to 72.1 ft) in width, depending on the width of the remaining bank line and of the exposed shoreline. The underwater portion of the Area of Potential Effect measures approximately 187 m by 620 m (613.5 by 2,034 ft), and covers an area of about 12 ha (29 ac). It consists of the steeply sloping channel of the Mississippi River. Numerous submerged anomalies and several known shipwrecks were identified within the Area of Potential Effect. Current construction plans call for the extant Mississippi River bankline to be cleared of vegetation, graded to a uniform slope, and covered with stone. The plans also call for a section of the revetment to extend onto the bankline, and for a portion of the bankline to be used as a staging area for construction of the underwater revetment.

Physiography

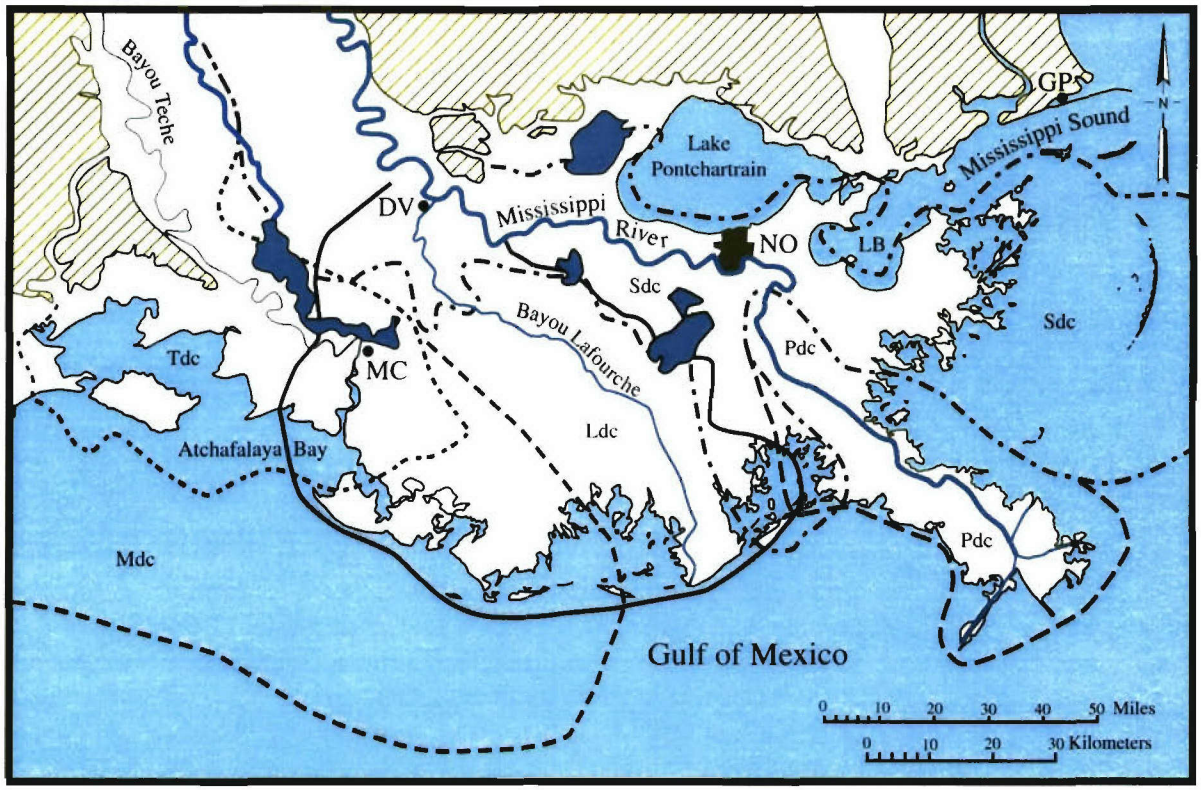
The project area lies within the Mississippi Delta Plain portion of the Holocene deltaic plain physiographic region as defined by Hunt (1974). The Mississippi Delta Plain consists of a complicated geomorphic surface that formed through the periodic progradation of delta complexes of the Mississippi and Red Rivers over the past 9,000 years (Frazier 1967; Penland et al. 1987). This surface consists of numerous coalesced or partially buried delta plains that comprise the surface of individual delta complexes. The surface of each of these delta plains typically exhibits the classic radial pattern of relict deltaic distributaries as described by Kolb and Van Lopik (1966), and mapped by Saucier and Snead (1989) and Snead and McCulloh (1984).

The proposed project area lies within the St. Bernard Coastal Region (Figure 4). This region consists of the partially submerged and slowly subsiding delta plains of the St. Bernard (Metairie-La Loutre) Delta Complex. The delta plains consist of eastwardly radiating bayous and natural levee ridges that represent the abandoned distributary systems of the inactive delta complex (Treadwell 1955). The portions of the deltaic plain situated adjacent to the Mississippi River have been modified by the lateral migration of its channels and by the formation of its levees (Kolb and Saucier 1982:80; Kolb and Van Lopik 1966:27-33).

Thus, the project area consists of Mississippi River natural levee and adjacent former inland swamp, deposits that were formed during progradation of the St. Bernard Delta Complex. Overall, the surface deposits have been disturbed extensively or destroyed by industrial, modern, and urban development associated with the growth of the city of New Orleans.

Geomorphology

The delta plains that constitute the St. Bernard Delta Complex are geomorphic surfaces constructed by the aggradation of deltaic sediments. The plain formed by the constructional surfaces of a set of delta lobes fed from a common trunk channel is called a "delta plain." The subsurface deltaic sediments and the delta plain formed by a set of delta lobes fed from a com-



LEGEND

Delta Complexes

Mdc - - -	Maringouin	9,000 - 6,500 BP
Tdc ·····	Teche	5,800 - 3,900 BP
Sdc ——	St. Bernard	4,800 - 1,800 BP
Ldc — · —	Lafourche	1,500 - 0 BP
Pdc — —	Plaquemines	1,350 - 0 BP

River or Bayou

Lake or Gulf

Pleistocene Terrace

• City or town - DV Donaldsonville
GP Gulfport
NO New Orleans
MC Morgan City

Figure 4. **Holocene Mississippi delta complexes. Redrawn and modified from Saucier (1994).**

mon trunk channel constitutes a single delta complex. An individual delta lobe consists of a set of subdeltas and minor distributaries supported from a single, major distributary (Coleman and Gagliano 1964; Frazier 1967).

In this chapter, the term "delta plain" is reserved solely for the subaerial, constructional surface of a delta complex. Some recent studies, e.g., Penland et al. (1987), confused geomorphic surfaces and subsurface sediments by incorrectly extending the definition of a "delta plain" to include both the surface of the delta and the sediments that form this surface. This definition is incorrect, because a plain of any type is strictly a geomorphic surface consisting of level or nearly level land that lacks reference to the deposits that form it (Goodwin et al. 1991:21-22).

Delta Complexes

A delta plain consists of the upper surface and bounding discontinuity of a depositional sequence of deltaic sediments that lies between upper and lower bounding discontinuities. The lower bounding discontinuity of these sedimentary sequences is defined by an erosional unconformity created either by fluvial or marine processes. Because these sedimentary sequences can be defined and mapped by bounding discontinuities, they are described as alloformations according to formal stratigraphic nomenclature (North American Commission on Stratigraphic Nomenclature 1983:865-867). Because these alloformations have not been named formally or defined as such, an informal allostratigraphic unit, the "complex," is used. A complex is defined as a single or temporally related set of such surfaces and associated sedimentary sequence or sequences (Autin et al. 1990:20, 1991:556).

As used by Frazier (1967), a "delta complex" is an allostratigraphic unit consisting of a lower bounding discontinuity, a regular sequence of deltaic facies, and an upper bounding sequence. The lower bounding discontinuity is represented by either an erosional surface or an older constructional geomorphic surface. Typically, the deltaic sequence consists of a basal layer of transgressive sediments, a middle unit of fine-grained progradational sediments, and an upper unit of aggradational natural levee and marsh sediments. The upper surface of a delta complex, the delta plain, is formed by aggradation sediments.

The lower bounding discontinuity was formed by the landward movement of the shoreline over previously subaerial delta or coastal plain. As the shoreline migrated landward, the beach shoreface typically cut deeply into the underlying Pleistocene or Holocene age sediments. As a result, the upper sediments that comprised the former delta or coastal plain were eroded and reduced commonly to transgressive sand lags. If a significant period of time lapsed between the submergence of an area beneath the Gulf of Mexico and the influx of deltaic sediments, then clayey silts and silty clays would have accumulated upon the basal sand lag. Within the New Orleans area, the transgressive deposits consist of soft, grayish, interbedded and intergrading sands, silty sands, silts, and sandy clays that typically contain whole shells, pieces of shells, and microfossils. These transgressive deposits laterally grade into buried barrier island and shoal sands north of the Metairie Ridge (Kolb and Saucier 1982; Otvos 1978; Penland et al. 1985; Saucier 1963).

When a delta complex progrades into the gulf, a thick sequence of progradational deposits accumulates. Initially, clay is deposited from suspension to form a thick blanket of unfossiliferous, parallel-laminae, and fine-grained sediments called "prodelta facies"(Figure 5:A) As the delta moves seaward, the prodelta facies become siltier and parallel, and lenticular laminae of silt appear and increase in abundance. With continued progradation, the accumulating progradational deposits consist of laminated silts and clays with thin sand layers called "delta front facies" (Figure 5:B). Kolb (1962:41-44) and Britsch and Dunbar (1990:22-23) considered these delta front facies to be part of "interdistributary facies." The uppermost portion of these delta front facies form as a bar at the mouth of a distributary. The bars consist of interbedded silts and silty sands that display a wide variety of sedimentary structures associated with currents and waves. These sediments have been called the "intradelta facies" by Kolb (1962:41-44) and Britsch and Dunbar (1990:23); they also have been designated as "distributary mouth bar facies" by Coleman (1982:34-39) and other sedimentologists.

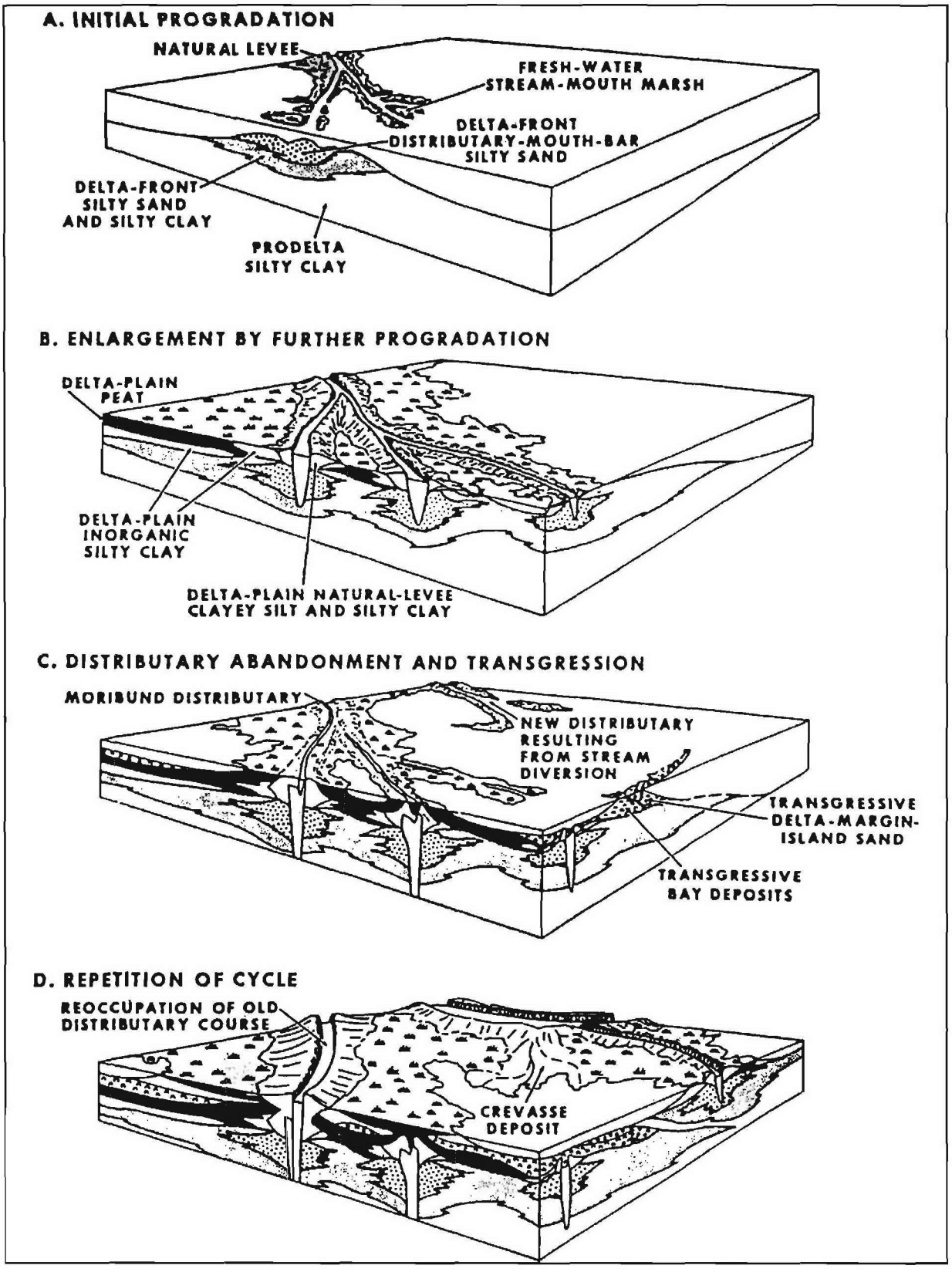


Figure 5. **Idealized surface and subsurface distribution of environments of deposition at several stages in a typical delta cycle (adapted from Frazier and Osanik 1965).**

The accumulation of natural levee and marsh sediments upon the subaqueous progradational deposits results in the formation of the subaerial delta plain of the delta complex. The deposition of sediment by floodwaters forms parallel low ridges bordering the distributary channel. Through breaks in the natural levees, floodwaters form crevasse splays that extend onto the adjacent delta plain and subdeltas that in turn extend into and fill the adjacent interdistributary bays (Figure 5:D). These sediments also are included within the "interdistributary facies" of Kolb (1962:41-44) and Britsch and Dunbar (1990:22-23). The natural levee and crevasse splay deposits consist of silts, sandy silts, silty sands, and very fine sands that are characteristically small-scale, cross-laminated, and rippled with intensively bioturbated zones. These sediments commonly are oxidized and contain abundant diagenetic materials such as iron sesquoxide, carbonate nodules, and cements. Organic marsh deposits accumulate within the periodically flooded land located away from the main distributaries (Coleman 1982:52).

Eventually, long-term delta lobe progradation leads to an overextension of the distributary network, and to a decrease in hydraulic efficiency. With time, the decrease in hydraulic efficiency causes an upstream diversion of the trunk channel, resulting in a switch to a shorter, more efficient course with a steeper gradient (Figure 5:C). This switch generates another delta complex at the end of this new river channel (Fisk 1960).

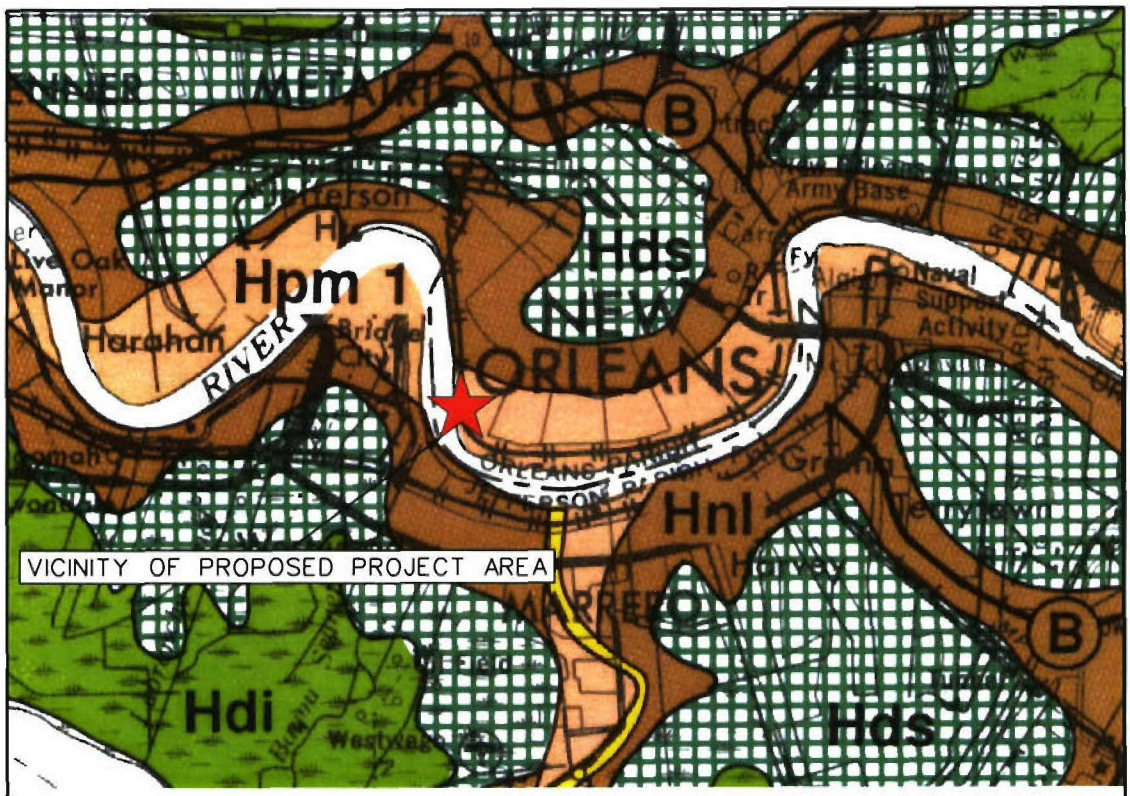
With the sediment needed to maintain the abandoned delta complex diverted to building a new delta, tectonic and compactional subsidence and eustatic sea level rise cause the old delta plain to sink beneath the Gulf of Mexico. As the delta sinks, marine processes rework the surface of the delta complex forming an erosional surface and transgressive sands that form the basal disconformity and basal deposits of a new depositional sequence. When a delta lobe progrades over this area, these deposits become part of a new delta complex (Penland et al. 1987).

Fluvial Complex

Overtime, the meandering of the Mississippi River within the Mississippi Delta Plain created a narrow meander belt. This meander belt represents the surface of a basic allostratigraphic unit, informally known as a "fluvial complex." A fluvial complex consists of a sequence of fluvial deposits bounded by a basal erosional surface and the upper constructional geomorphic surface of the meander belt. Typically, the basal bounding discontinuity is an erosional unconformity that forms by scour at the channel bottom and at the bank collapse of a cutbank of a channel (Autin 1989). Channel-deposited fluvial sediments overlie the basal unconformity. Generally, these sediments consist of a lower part composed of point bar sands and gravels, overlain by finer-grained and vertically accreted natural levee and overbank sediments (Walker 1984). The upper bounding discontinuity is formed by the meander belt. If later fluvial erosion truncates and buries the upper portion of a fluvial complex, the upper bounding discontinuity will consist of an erosional surface (Goodwin et al. 1991:22-24).

The lateral migration of the Mississippi River in the New Orleans area has created a meander belt measuring approximately 1.0 to 1.8 km (0.6 to 1 mi) in width. As the channel migrated laterally, its cutbank eroded the Holocene deltaic deposits and underlying Pleistocene sediments to depths of 35 to 40 m (115 to 131 ft) below sea level (Figure 6). The laterally migrating channel simultaneously backfilled the opposite bank with coarse-grained point bar sediments to form its narrow meander belt. Natural levee deposits from the Mississippi River have buried the deltaic plain adjacent to the meander belt and the point bar deposits within it. The ages, origin, and stratigraphy of the sediments found within the meander belt contrast sharply with the sediments forming the adjacent delta plain. Because of the restricted meandering of the channel, the meander belt within the New Orleans area lacks abandoned meander loops and oxbow lakes normally associated with meander belts (Kolb 1962:Plate 5 and 6; Kolb and Saucier 1982:80).

Relative to upstream reaches of the Mississippi River, the reach of the Mississippi River in the New Orleans area has an unusually narrow meander belt and extremely low rates of lateral migration. The narrow meander belt partially reflects the geologically short length of time that the Mississippi River has had to develop its me-



Statute Miles

5 0 5

5 0 5

Kilometers

Holocene Units (Alluvial Valley)

Hpm 1-6 — Point bar (meander scroll) deposits of Mississippi River meander belts 1 to 6. Meander belts of different ages separated by hachured lines with tick marks on the older meander belt side.

(A) — Abandoned courses of the Arkansas (A), Red (R), Black/St. Francis (B-SF), Black (B), White (W), and smaller (S) rivers.

Holocene Units (Deltaic and Chenier Plains)

Hnl — Natural levees in the deltaic plain associated with major distributaries and the present Mississippi River. Delineated where natural levees overlie interdistributary and other deltaic deposits, but not point bar deposits.

Natural levees not delineated in the alluvial valley because of their widespread and complex distribution.

Hdi — Interdistributary deposits. Represents brackish to saline marsh environments.

Hds — Inland swamp deposits. Represents freshwater swamp environment.

Figure 6. **Map of Quaternary Deposits of New Orleans, Louisiana and its environs (Saucier 1994; Plate 14).**

ander belt. Also, within the stretch of the Mississippi River from College Point (River Mile 160 and River Mile 80), the meander belt of the Mississippi River is carved into overconsolidated, durable, clayey Pleistocene sediments. These sediments form a natural revetment, limiting local migration. South of River Mile 80, channel migration is limited by the cohesive prodelta and delta front clays that form its banks (Kolb 1962:50-51, 1963:231-232).

Geology

The New Orleans area, as well as the remainder of southeastern Louisiana, lies directly upon the surface of a very thick wedge of sand, silts, and clays formed by sediment supplied by the Mississippi River. This wedge consists of approximately 12,000 m (39,370 ft) of alternating Neogene fluvial, deltaic, and marine deposits. These sediments represent the accumulation of hundreds of transgressive-regressive depositional sequences of which the St. Bernard Delta Complex is one of the latest. The uppermost 640 m (2,100 ft) of this clastic wedge consists of sediments that have accumulated during the Pleistocene Epoch. Only the upper 10 to 30 m (33 to 98 ft) of sediments accumulated during the last 10,000 years (Kolb and Saucier 1982:77-80).

A total of three well-defined complexes can be recognized within the current proposed project area. The youngest of these allostratigraphic units is described as the fluvial complex associated with the modern meander belt, Meander Belt No. 1, of the Mississippi River. The formation of Meander Belt No. 1 either has buried partially or has removed by erosion the Holocene deltaic sediments of the next older depositional complex, the St. Bernard Delta Complex. The sediments of the St. Bernard Delta Complex completely bury the third allostratigraphic unit, the Prairie Complex as defined by Autin et al. (1991:556-559).

Meander Belt No. 1 is the surface of an unnamed fluvial complex consisting of point bar and natural levee deposits of the Mississippi River. Generally, the fluvial sediments that form this complex consist of point bar sands that measure 35 to 45 m (115 to 148 ft) in thickness. Silty natural levee deposits measuring as much as 6 m (20 ft) in thickness cover these point bar deposits and form the surface of Meander Belt No. 1. Bordering the meander belt, a wedge-shaped body of natural levee deposits extends approximately 1 to 2 km (0.6 to 1.2 mi) away from the cutbanks of the Mississippi River and across the adjacent delta plain (Figure 6). Within and to the north of the proposed project area, the natural levee sediments laterally lap onto clayey inland swamp deposits and the surface of the adjacent St. Bernard Delta Plain. Radiocarbon dates ranging from 1000 to 1450 years BP from peats recovered at the base of natural levees and wood from the natural levees demonstrate that this segment of Meander Belt No. 1 is less than 1,200 years old (Kolb 1962; Kolb et al. 1975; Kolb and Saucier 1982; Saucier 1963).

Within the vicinity of the proposed project area, the St. Bernard Delta Complex consists of a depositional sequence measuring approximately 17 to 22 m (56 to 72 ft) in thickness (Figure 4). This depositional sequence consists of a basal 7 to 9 m (23 to 30 ft) of transgressive deposits overlain by 8 to 9 m (26 to 30 ft) of progradational deposits. Approximately 2 to 4 m (6 to 13 ft) of aggradational swamp and marsh deposits cap the progradational deposits and form the surface of the St. Bernard Delta Complex. The transgressive deposits appear to consist of a complex assemblage of shallow marine and nearshore sands, silty sands, sandy clays, clays, and silts that contain varying proportions of shell. The progradational deposits consist of a variety of typical prodelta, delta front, distributary mouth bar, and interdistributary sediments that cannot be differentiated with the available data. A layer of peaty and organically rich clayey swamp and marsh deposits measuring 2 to 3 m (6 to 10 ft) in thickness constitutes the uppermost, aggradational portion of the St. Bernard Delta Complex. To the north, these sediments partially bury and partially interfinger with natural levee deposits of the Metairie Ridge. Its channel has removed the deltaic deposits underlying this relict distributary ridge (Kolb 1962; Kolb et al. 1975; Kolb and Saucier 1982; Saucier 1963).

Various geologic and geomorphological studies have demonstrated that the delta plain of the St. Bernard Delta Complex is sinking relative to sea level at a culturally significant rate. For example, Ramsey and Moslow (1987:1685)

estimated from tidal gauge data that relative sea level rise within the New Orleans area ranged from 0.5 to over 1.0 cm (0.2 to over 0.4 in) per year from 1962 to 1982. However, this rate includes extreme subsidence caused by artificial dewatering and oxidation of organic matter within deltaic sediments (Kolb and Saucier 1982:90). Regional rates of 12 cm (5 in) per century determined by Saucier (1963:14) and 24 cm (9 in) per century determined by Kolb and Van Lopik (1958) likely are more accurate estimates of delta plain subsidence in the region.

A total of two, and possibly three, depositional sequences and unnamed alloformations belonging to the Prairie Complex directly underlie the St. Bernard Delta Complex. Within the New Orleans area, these depositional sequences and allostratigraphic units consist of indistinguishable and heterogeneous assemblages of deltaic, shallow marine, and strandline deposits. Possible point bar deposits occur within the uppermost Pleistocene depositional sequence. The uppermost depositional sequence is presumed to date from the Middle Wisconsinan era, while the depositional sequence possibly is Sangamonian in age. Miller (1983:95) has obtained a date of 31,270 ±370 years BP from wood recovered from within deltaic deposits of the uppermost depositional sequence. North of Lake Pontchartrain, the exposed surfaces of two of these depositional sequences form the coast-parallel Prairie Terrace as mapped by Saucier and Snead (1989) (Autin et al. 1991:556-559; Kolb et al. 1975; Saucier 1977:10-13).

The depositional sequences present within the Pleistocene deposits are defined by the occurrence of well-defined, often erosionally truncated, weathering horizons. The top of the Prairie Complex, within the project area, is marked by a well-developed weathering horizon that occurs at an approximate depth of 18 to 22 m (59 to 72 ft) below sea level. This weathering horizon, called the "First Pleistocene Horizon" by Kolb et al. (1975:4), is distinguished from overlying Holocene material by a mottled orange, tan, or greenish gray color, an abrupt decrease in water content, an increase in stiffness and shear strength, and by the presence of calcareous nodules. Additional weathering horizons have been penetrated by borings at depths of 40 to 70 m (131 to 230 ft) below sea level within the vicinity of the project area. Each of these weathering horizons is associated with significant unconformities that form the bounding discontinuities of unnamed alloformations. Unfortunately, because of a lack of data, it is unknown if the weathering horizon at a depth of 70 m (230 ft) below sea level represents the IG-2 paleosol of Autin et al. (1991:Figure 4), which defines the upper surface of the deposits on which the Prairie Complex rests (Kolb et al. 1975; Saucier 1977:10-13).

The geology of the surrounding area strongly influences the potential for encountering archeological deposits within the current project area. Any Paleo-Indian or Early Archaic cultural resources located within the project area would be situated near the top of the Prairie Complex, approximately 18 to 22 m (59 to 72 ft) below modern sea level. Rising sea levels inundated the region during the Middle and Late Archaic stages, preventing formation of any sites at that time. The subsequent progradation of the St. Bernard Delta Complex, between approximately 3400 and 1600 years BP, covered the inundated Prairie Complex, and developed the project area vicinity. This, in turn, has been modified and partially covered by Meander Belt No. 1, which remains active to the present (Goodwin et al. 1991). Only the subaerial natural levee deposits of the St. Bernard Delta Complex and Meander Belt No. 1 have a potential for containing buried archeological deposits. Therefore, buried archeological deposits will be restricted to three narrow stratigraphic intervals within the sedimentary sequences that underlie the current project area. Late prehistoric and all historic archeological deposits would lie near and at the surface of the historic New Orleans landscape.

Paleogeography

During the Late Pleistocene Stage, i.e., from approximately 132,000 to 10,000 years BP, the accumulation and dissolution of continental ice sheets caused eustatic sea level to fluctuate between 20 to 70 m (66 to 230 ft) below present sea level. This occurred in 20,000 year cycles. Maximum high sea level stands occurred at approximately 120,000 year intervals during interglacial periods such as the Holocene Epoch and the early Sangamonian Stage. As a result, the paleogeography of southeastern Louisiana

changed as the shoreline migrated north and south across the southeast Louisiana continental shelf and coastal plain. The Sangamonian high sea level stand reached an approximate elevation of 6 to 7 m (20 to 23 ft) above present sea level around 120,000 years BP during Oxygen Isotope Stage 5E. The northern portion of the coast-parallel Prairie Terrace probably was an active series of coalesced alluvial plains at that time (Autin et al. 1991:556-558; Moore 1982; Suter et al. 1987).

Wisconsinan Stage

During the Late Wisconsinan Stage, the 20,000 year cycle of eustatic sea level fluctuation created a series of depositional sequences. The fall in sea level at that time resulted in an expansion of the coastal plain onto the modern continental shelf, and the accumulation of thin, laterally extensive deposits of shelf-phase deltas, and eventually, thick fluvial deposits. At maximum low stand, the dropping of sea level below the shelf edge caused entrenchment of the shelf by fluvial systems; subaerial exposure of the shelf; and, the deposition of thick shelf-margin deltas at the shelf edge. When sea level rose, the ensuing transgression submerged, eroded, reworked, and redistributed fluvial and deltaic deposits as broad sand sheets and shoals. As the rise in sea level ceased or slowed to a low rate, fluvial systems, delivering abundant supplies of sediment to the coast, built deltaic complexes that prograded seaward onto the shelf (Coleman and Roberts 1988; Suter et al. 1987) (Figure 7).

Each cycle of eustatic sea level fluctuation in the area created a depositional sequence of fluvial, deltaic, estuarine, and marine sediments separated either by exposure surfaces or erosional unconformities. As a result, an accumulation of sediments consisting of multiple depositional sequences that form the modern continental shelf and coastal plain of Louisiana was left behind (Coleman and Roberts 1988; Suter et al. 1987). The two upper sequences of Pleistocene sediments that underlie the New Orleans area appear to represent depositional sequences deposited between 21,000 and 120,000 years ago (Autin et al. 1991:558; Saucier 1977:10-13).

By approximately 21,000 years ago, at the start of the Late Wisconsinan Substage, relative sea level dropped from the highest Middle Wisconsinan high stand of 20 m (66 ft) below present sea level to its maximum Late Pleistocene low stand at approximately 120 m below present sea level. In response, the shoreline moved to the modern shelf edge, subaerially exposing large areas of the continental shelf. Surficial weathering at this time formed the "First Pleistocene Horizon," a truncated weathering horizon (Kolb et al. 1975:4). The Mississippi River and its tributaries responded by partially re-entrenching the Mississippi Valley by 25 to 30 m (82 to 98 ft). Similarly, the major streams and rivers within the New Orleans areas were entrenched by 6 to 9 m (20 to 30 ft) (Kolb et al. 1975:Plate 2; Saucier 1963:Figure 14, 1977:10-13; Suter et al. 1987).

During the latter part of the Late Wisconsinan Substage, relative sea level rose episodically from approximately 120 m (394 ft) below sea level to 30 m (98 ft) below sea level by 10,000 years ago. A wide, deeply cut erosional terrace along the edge of the outer continental shelf records a sea level still stand about 80 to 90 m (262 to 295 ft) below modern sea level. In addition, during a stillstand between 9200 and 8200 years BP, the Outer Shoal Delta Complex, whose delta plain currently lies at depths of 15 to 25 m (49 to 82 ft) below sea level, might have formed (Frazier 1974; Goodwin et al. 1991:36).

Holocene Epoch

As the Late Wisconsinan-Holocene sea level rise submerged the modern Louisiana continental shelf, the transgressing shoreline substantially modified its surface. The degree of transgressive erosion varied from the minor removal of overbank deposits from natural levees to the complete erosion of the alluvial plains within coast-parallel terraces. During still stands, local accumulations of lagoonal, chenier, or other aggradational coastal plain deposits may have buried the coastal plain deep enough to have protected it from transgressive erosion (Pearson et al. 1986:224-245; Suter et al. 1987).

In addition, shelf and transgressive shoreface processes substantially modified both strandlines and deltas. Shoreface erosion deeply eroded the surfaces of Late Wisconsinan and Early to Middle Holocene deltas forming extensive ravinement surfaces. Shelf and sound processes eroded and redistributed the upper parts of

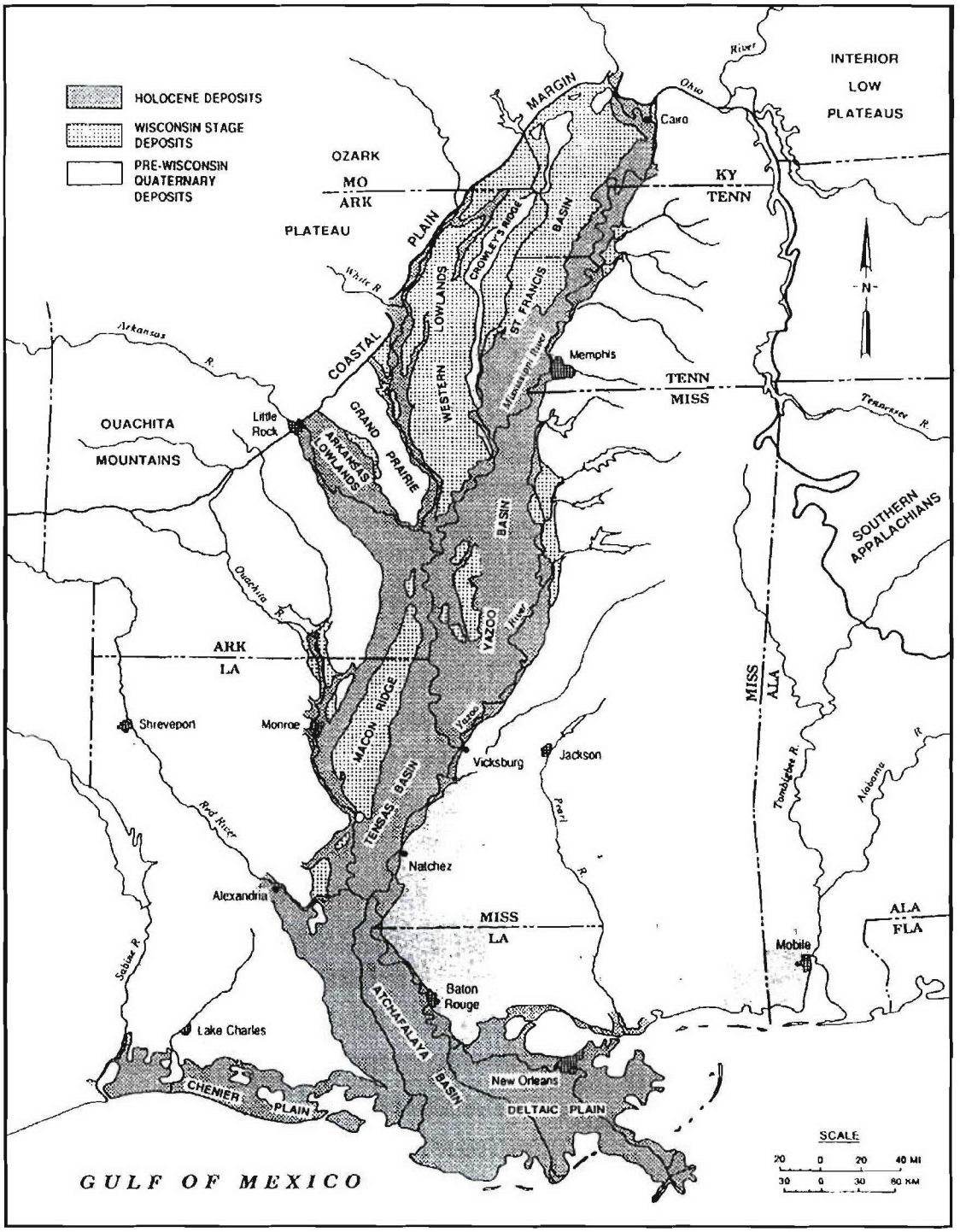


Figure 7. **The Mississippi Alluvial Valley and the total distribution of the Quaternary deposits in the lower Mississippi Valley portion of the Gulf Coastal Plain (adapted from Saucier 1994).**

many barrier islands, cheniers, and deltas into marine sheet sands and east-west oriented sand shoals. Although three or four of these offshore sand ridge trends represent the remains of drowned strandlines, the original barrier islands and beach deposits have been reworked almost totally into marine sand shoals. During this time, the entrenched valleys of the Mississippi River and local streams were filled with fluvial, estuarine, and sometimes lagoonal sediments (Frazier 1974:19-24; Penland et al. 1985, 1987; Suter et al. 1987:210-214) (Figure 7).

Between approximately 7500 and 5500 years ago, a stillstand occurred during an otherwise rapid rise in sea level, at a depth of 5 to 6 m (16 to 20 ft) below present. During this stillstand, the Mississippi River apparently built the Maringouin Delta Complex around 7300 to 6200 years ago (Frazier 1967, 1974). Frazier (1967:269) noted the presence of two stacked, depositional sequences within this delta complex.

As sea level rose, the Gulf of Mexico flooded the Late Wisconsinan eastern Louisiana coastal plain. By 5000 years ago, the shoreline reached the edge of the modern Prairie Terraces forming the Pontchartrain embayment. Between 5100 and 4000 years ago, longshore currents created and maintained a chain of barrier islands and shoals that extended southwest across the embayment from the mouth of the Pearl River. This chain of shoal and scattered islands, called the "New Orleans Trend," created the gulfward boundary of the ancient Pontchartrain Bay. By about 5000 years BP, rising sea level also flooded the Mississippi Alluvial Valley and created a brackish water embayment that extended to the latitude of Baton Rouge (Otvos 1978; Saucier 1963:44-46).

The renewed rise in sea level to the west submerged most of the surface of the Maringouin Delta Complex. The development of the Teche Delta Complex began around 5,800 years ago after the rising sea level submerged most of the Maringouin Delta Complex. The Mississippi River built the Teche Delta Complex over the Maringouin Delta Complex between 5800 and 3900 years BP (Frazier 1967; Weinstein and Gagliano 1985:120-123).

The Mississippi River began to change in course from Meander Belt No. 3 to Meander Belt No. 2 near Marksville, Louisiana by approximately 4800 years BP. This diverted much of its flow down the eastern and central part of the Mississippi Alluvial Valley (Autin et al. 1991). As a result, a new delta complex called the "early St. Bernard Delta Complex" by Frazier (1967) and the "Metairie Delta Complex" by Weinstein and Gagliano (1985:122-123) prograded into and through the New Orleans area. The main delta of this complex prograded approximately 70 km (43 mi) to the southeast of New Orleans into the Gulf of Mexico. By 4000 years BP, another small delta of this complex prograded northeast and buried a chain of southwest trending barrier islands, the New Orleans Barrier Island Trend. The New Orleans Trend shifted slightly eastward to form the Bayou Sauvage Trend of shoals and barrier islands. The burial of the New Orleans Trend by deltaic deposits remade Pontchartrain Bay into a brackish water bay, ancestral to Lake Pontchartrain (Otvos 1973: 31-33; 1978; Saucier 1963:56-59).

The Metairie Delta Complex developed into the La Loutre Delta Complex (Weinstein and Gagliano 1985:123) or the St. Bernard Delta Complex (Frazier 1967) from approximately 3400 to 1600 years BP. This delta complex formed two major delta lobes that prograded from the New Orleans area. The larger delta, the La Loutre Delta, prograded eastward to form most of St. Bernard Parish. By 3000 years BP, this delta lobe buried the New Orleans Trend creating Lake Pontchartrain. A smaller delta, the Des Familles Delta, prograded southward from the New Orleans region. From 1800 to 600 years BP, only the Bayou Sauvage delta of the St. Bernard Delta Complex remained active.

Lopez (1991) proposed that Lake Pontchartrain formed as a principle result of Holocene activity along a fault zone near the center of Lake Pontchartrain. His model suggests that the area within Lake Pontchartrain initially was filled by deltaic deposits of the St. Bernard Delta Complex. After formation of the St. Bernard Delta Complex, faulting down the center of Lake Pontchartrain opened an initial body of water that later was expanded by shoreline erosion. This model is inconsistent with (1) the general absence of Holocene deltaic deposits on the bottom of Lake Pontchartrain; (2) the lack of

significant displacement of the First Pleistocene Horizon and only 4.5 m (15 ft) of displacement of the Second Pleistocene Horizon by the faulting within Lake Pontchartrain; and (3) the occurrence of over 15 m (49 ft) of displacement along the fault forming the edge of the Prairie Terrace and the northern lake shore (Kolb and Saucier 1982: Figure 4; Saucier 1963, 1977: Figure 3; Kolb et al. 1975). At this time, the available data fail to support the Lopez (1991) model.

Bayou Lafourche slowly prograded southward from the New Orleans region between 4800 and 2000 years BP; it reached Thibodaux by the end of this period. Between 3500 and 2000 years BP, some flow continued to be diverted down Bayou Lafourche extending it slowly southward, building the Terrebonne and Lafourche delta lobes (Weinstein and Gagliano 1985:123). The distributaries of the Terrebonne Delta Complex probably reoccupied relict distributaries of the former Teche Delta Complex. The Lafourche Delta Complex reached its peak discharge by 2000 years BP.

By approximately 1000 years BP, the discharge through the Lafourche Delta Complex began to wane as the discharge of the Mississippi River reoccupied the St. Bernard/La Loutre Delta Complex. Flow through the Terrebonne Delta stopped, and active progradation of that delta ceased. Since then, the Terrebonne Parish region continued to subside and to deteriorate. Bayou Lafourche remained an active distributary of the Mississippi River until it was artificially closed in 1904 (Weinstein and Gagliano 1985:144).

Approximately 1000 years BP, the relict feeder channel of the St. Bernard (La Loutre) Delta Complex was reoccupied partially and a delta of the Plaquemines Delta Complex prograded through the interlobe basin between the Des Families and La Loutre Deltas of the St. Bernard Delta Complex. Initially, the discharge flowed through a series of channels in this basin, such as the River aux Chenes, Belair, and Bayou Grande Cheniere. By approximately 600 years BP, the Bayou Grande Cheniere became the modern course of the Lower Mississippi River. As the shoal-water Plaquemines Delta Complex prograded off the shelf edge, the shelf-margin Balize Delta formed (Weinstein and Gagliano 1985:125, 143).

Depositional Environments

Three environments of deposition are represented in the upper several meters of the Holocene sedimentary sequence in the vicinity of the project reach. These structural features are discussed below in order of their relative importance. A fourth environment (or series of related environments) is present in the subsurface deposits in the vicinity of the proposed project reach. Although the environment is not directly related to the human occupancy of the project reach, its presence and characteristics are important in understanding the Holocene land-use history of the area.

Natural Levees

Natural levees form along streams or rivers that carry high suspended sediment loads and that periodically overtop their banks (Figure 8). Most natural levee deposits are laid down during floods by sediment carrying sheet flow that is filtered by heavy vegetation. During times of major flooding, however, overbank flow may become channelized, forming crevasses. Scour pools and incised channels may form across the natural levee crests and they will be backfilled naturally with silt and fine sand as the flood waters recede (Figure 8). Consequently, either one or both of two depositional patterns may result across the distal natural levee. The first is a fan-shaped crevasse splay that radiates outward from the point of crevassing and that consists of a thin veneer of mostly silts with some clays. The second is a small distributary-like channel (sometimes called a crevasse channel) that extends into the backswamp area flanking the natural levee. The crevasse channel is conspicuous because of a small, downstream-narrowing, flanking natural levee ridge (Figure 8). Flow through the crevasse channel may last no longer than a single major flood event or it may persist over several successive floods. With both the splays and the crevasse channels, a net effect is an unusual widening of the natural levee ridge near the point of crevassing.

Backswamps

Backswamps (or inland swamps) are flood basin areas situated between natural levee ridges that receive only the finest sediments (mostly clays) during times of overbank flooding and

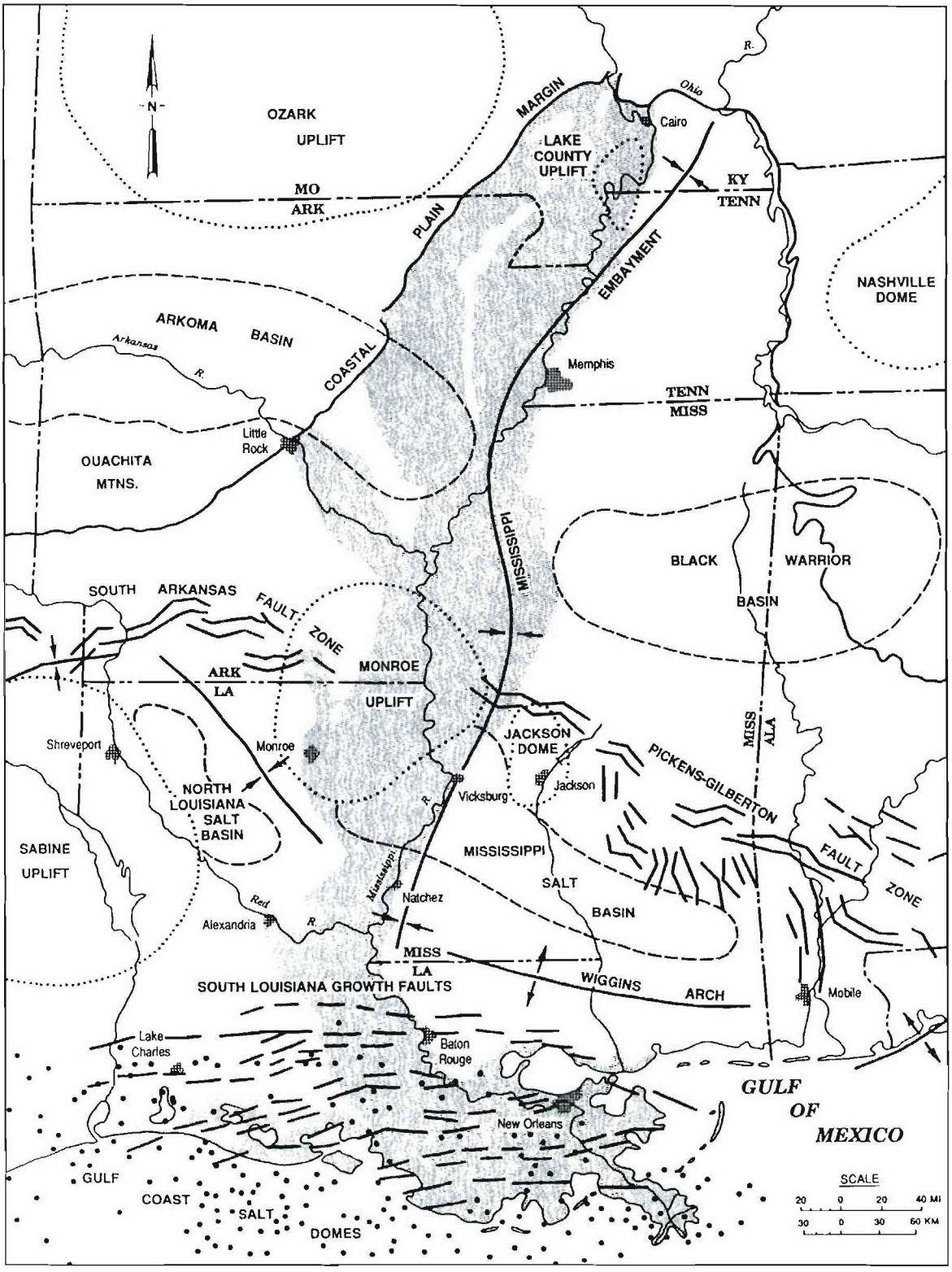


Figure 8. **Major structural features of the Lower Mississippi Valley (modified from Autin et al. 1991).**

basin inundation (Figure 8). Backswamps are flat, poorly drained, forested tracts underlain by tens of meters of largely unoxidized gray clays mixed with some silt layers. Considerable organic matter is present throughout the deposits, but layers of pure peat are infrequent and they are restricted to the deeper swamp areas. Backswamp soils are classified as Sharkey or Barbary association and they support a swamp forest vegetation assemblage characterized by cypress (*Taxodium distichum*) and tupelo (*Nyssa aquatica*).

Point Bar

Areas of point bar accretion result from the process of stream meandering, which involves the erosion and caving of outer banks in bends and the corresponding formation of point bars along inner banks (Figure 8). In the subsurface, point bar deposits extend to the maximum depth of scouring in the migrating channel. The deeper deposits consist of the bed load of the river, which is mostly gray and brown silts and fine to medium sands. They become slightly finer grained in the upper several meters, with laminated clays, silts, and sands present.

Areas of relatively recent point bar accretion are characterized by distinctive sequences of linear, parallel, low, sandy ridges and clay-filled swales. Many of these occur on the batture along the project reach. The orientation of the ridge/swale sequences indicates the direction of movement of the parent channel. Above the lower water plane of the river, point bar deposits grade upward into natural levee deposits, i.e., where vertical accretion becomes dominant over lateral accretion after the channel migrates away from a given point. Where the rate of channel migration is slow, as it has been in the project reach, subsequent natural levee growth can be considerable and it often completely obscures the underlying point bar accretion topography.

Undifferentiated Deltaic Plain

Beneath the natural levee and associated backswamp deposits located in the vicinity of the project reach is a thick sequence of heterogeneous Holocene deposits referred to simply as undifferentiated deltaic plain (Kolb 1962). The sequence directly overlies the Pleistocene erosional surface. Based on subsurface information recovered from elsewhere in southeastern Louisiana (Kolb 1962; Kolb and VanLopik 1958), the sequence conceptually should consist of sediments laid down in several discrete depositional environments. The deepest of these should be a zone of nearshore Gulf deposits representing the transgression of the post-glacial rising sea level across the eroded Pleistocene land surface. These deposits typically consist mostly of silts and sands with varying amounts of clay and organic debris. Fine-grained sediments are quite limited, since the area did not experience Mississippi River sedimentation at that time. The remainder of the Holocene sequence should consist dominantly of Mississippi River marginal deltaic sediments laid down in a shallow prodelta and/or interdistributary environment. These consist of layers of clays, silty clays, and fine sands with abundant shells that represent the formation of the initial delta lobe of the St. Bernard complex. That was a time of slowly rising sea level, considerable subsidence, and a landscape dominated by intratidal marshes, tidal channels, and shallow lakes and bays.

Natural Riverine Processes

Alluvial deposition, lateral migration, and crevasses are the primary riverine processes that affect the preservation of archeological sites. Alluvial deposition refers to those sediments deposited by the river during periods of overbank flooding. Historically, the Mississippi River rose during the annual spring floods overflowing its normal banks. As it rose, it slowed and deposited suspended sediments, resulting in the formation and building of a natural levee. Natural alluvial deposition, however, has been altered by artificial levee construction, i.e., floodwaters that once inundated the natural levee now are confined to the river and the batture. This has had several effects on the Area of Potential Effect. For example, during overbank flooding the artificial levee confines the river to an artificially narrow course, and since the river cannot spread across the broad natural levee, its speed during floods is considerably faster than it was prior to the construction of the artificial levee. Thus, much of the sediment load added to the river through lateral migration, and which previously was deposited on the land, now is dumped at the mouth of the river. In addition,

increased flow speed may cause scouring and destruction of underwater archeological sites.

Meandering is a dynamic process that results in lateral migration of the river in a downstream direction. This lateral migration includes both the cutting of banks and downriver accretion. This process is controlled by the poised nature of the river. In other words, the Mississippi River has no apparent overall tendency to either aggrade or degrade its channel; it generally carries as much sediment to the Gulf as is brought in by its tributaries. Therefore, the sediment added to the river through cutting and caving is deposited on an aggrading bank within a fairly short distance. In effect, sediments are "traded" from caving banks to downriver bars. The formation of these bars is dependent on the volume of sediments deposited into the river by upriver caving banks. This, in turn, is dependent on the local characteristics of the alluvium (Fisk 1943:37-39; Walters and Simons 1983:321).

The primary factors governing cutting and accretion are the speed and direction of the river. At a bend in the river, the concave bank, i.e., where the river is forced to turn, is subject to cutting. The river moves faster in that area as it is turned by the riverbank to a new direction. In addition to cutting the bank, the river also scours the riverbed adjacent to the cutbank, deepening the channel. Sediments cut from the bank and riverbed are held in suspension until the river slows and they gradually are precipitated. This normally occurs at point bars, along the convex bank at the next river bend, or at a crossing bar, which may form on the riverbed along a straight reach. The overall effect of these processes is to change the course of the river gradually (Elliott 1932:122-123).

Crevasse channels and splays are associated with both the natural and the artificial levee systems, especially during periods of flooding. As water levels begin to drop, the super-saturated levee can become unstable (Newton 1987:40). This instability can result in the formation of small breaks or ruptures in the levee known as crevasse channels. These channels extend away from the main course, and they allow floodwaters and sediments to pour through the opening into the backswamp where fluvial features are formed. Crevasse channels generally are shallow and they are characterized by broad natural levees. The localized nature of crevasse channels stems from the fact that these channels generally receive flow only during periods of flooding (Smith et al. 1986:13). Most crevasses are filled quickly with sediment dropped from the flow as it passes out of the main river course into the backswamps (Newton 1987:40-41).

Crevasse splays are associated directly with crevasse channels. As water moves through the crevasse opening to the backswamp, large quantities of coarse-grained sediments are deposited at the distal end of the crevasse channel. As the stream leaves the confines of the main channel, sediments are dropped in a distinct triangular or fan-shaped formation in a direct response to the lack of a defined course (Smith et al. 1986:14).

Archeological Implications

Prior to artificial levee construction, the cumulative effects of alluvial deposition were considerable in the vicinity of the Area of Potential Effect; however, the artificial levees have protected the land behind the levees from inundation, and therefore from substantial alluvial deposition (Elliott 1932:124-125). This has increased the amount of alluvial deposition on the batture, and it has obscured and destroyed archeological deposits, often making them difficult to find using standard archeological survey techniques. Therefore, modification of survey methods for deep testing should be made in these settings.

While the effects of lateral migration vary along the river, riverbank migration is an integral part of the continuing development of the river and it is a major factor in near-shore site destruction. On the other hand, archeological remains located on the aggrading bank (opposite the proposed project area) have been covered with a considerable amount of sediment, making their discovery and possible recordation unlikely.

Finally, crevasses clearly affect archeological deposits adversely. The channels scoured by crevasses can destroy archeological sites over which they pass, while the sedimentation associated with a crevasse can cover a site, potentially preventing its identification. In addition, crevasses require additional levee construction, normally a setback, which further impacts the preservation of cultural resources.

Soils

Within the overall project area, a single soil series is present: the Sharkey-Commerce Series (Figure 9). The Sharkey-Commerce Series comprises approximately 26 percent of the land surface of Orleans Parish; the soils are level and poorly drained and are located on the natural levees of the Mississippi River and its distributaries. Sharkey soils compose approximately 50 percent of this series, and they typically have a very dark grayish brown silty clay loam or dark gray clay surface layer while the subsoil is composed of gray or dark gray clay. The Commerce soils make up approximately 40 percent of the soil series and they generally exhibit a surface layer of dark gray silt loam or silty clay loam with a dark grayish brown, grayish brown, or gray silty clay loam subsoil. The remaining 10 percent is composed of soils of minor extent, i.e., Harahan soils (Trahan 1989).

As a whole, these soils are poorly to moderately well suited to building and site development. The main limitations of this soil series include wetness, moderately slow permeability, and the shrinking and swelling of the subsoil. In addition, the Sharkey soils are subject to rare flooding after especially severe storms. These soils are, however, well suited to pasture and moderately well suited to woodland and cultivation. Still, to produce optimum crop yields a good drainage system is necessary (Trahan 1989). According to the U.S. Soil Conservation Service soil survey, these soils are not suited to urban, commercial, or recreational usage. It is suggested that fill material be deposited on these soils to raise the surface above flood levels before they are utilized for urban uses (Trahan 1989:18).

Fauna and Flora

The flora and fauna of the general project region varies greatly between the natural levees and adjacent freshwater swamps. The differences in fauna and flora result from the distinct differences in the drainage of each area (Penfound and Hathaway 1938).

Flora and Fauna of the Natural Levee

Little is known about the native vegetation community that existed on the natural levees of the New Orleans area prior to its occupation by European settlers. Presumably, it resembled the vegetative communities still found on natural levees of distributaries elsewhere in the Mississippi Delta Plain. If so, these natural levees were covered by an oak forest floral assemblage. The principle overstory within the oak forest would have been: water oak (*Quercus nigra*), overcup oak (*Quercus lyrata*), cottonwood (*Populus deltoides*), sweetgum (*Liquidambar styraciflua*), sycamore (*Platanus occidentalis*), redgum, black willow (*Salix nigra*), hackberry (*Celtis laevigata*), swamp privet (*Forestiera acuminata*), water locust (*Gleditsia aquatica*), and honey locust (*Gleditsia triacanthos*). The understory would have included shrubs such as buttonbush (*Cephalanthus occidentalis*), wax myrtle (*Myrica cerifera*), dwarf palmetto (*Sabal minor*), marsh elder (*Iva annua*), elderberry (*Sambucus canadensis*), and yaupon (*Ilex vomitoria*), and vines such as trumpet creeper (*Campis radicans*), poison ivy (*Rhus radicans*), and rattan vine (*Berchmis scandens*). The groundcover of the natural levee would have consisted of various grasses (Gramineae) and sedges (Cyperaceae) (Craig et al. 1987; Penfound and Hathaway 1938) (Table 4).

Similarly, little is known about the fauna present within the prehistoric oak forests that grew on the natural levees of the Mississippi River. However, these forests, as elsewhere in the Mississippi River Delta, undoubtedly supported a variety of mammals, birds, and reptiles. The fauna typically found within the natural levee terrain included mammals such as white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), eastern cottontail (*Sylvilagus floridanus*), swamp rabbit (*Sylvilagus aquaticus*), and black bear (*Ursus americanus*) (Table 5).

The fauna associated with these oak forests also included predator mammals such as red fox (*Vulpes fulva*), gray fox (*Urcyon cinereoargenteus*), raccoon (*Procyon lotor*), long-tailed weasel (*Mustela frenata*), mink (*Mustela vison*), and bobcat (*Felis rufus*). These species, together with raptors, are important in limiting the size of rabbit, mouse, squirrel, and bird populations. The mink, opossum (*Didelphis virginiana*), and raccoon are important, as is the nutria (*Mycocaster coypus*) a recently introduced species, as furbearers. Some of the birds found within these

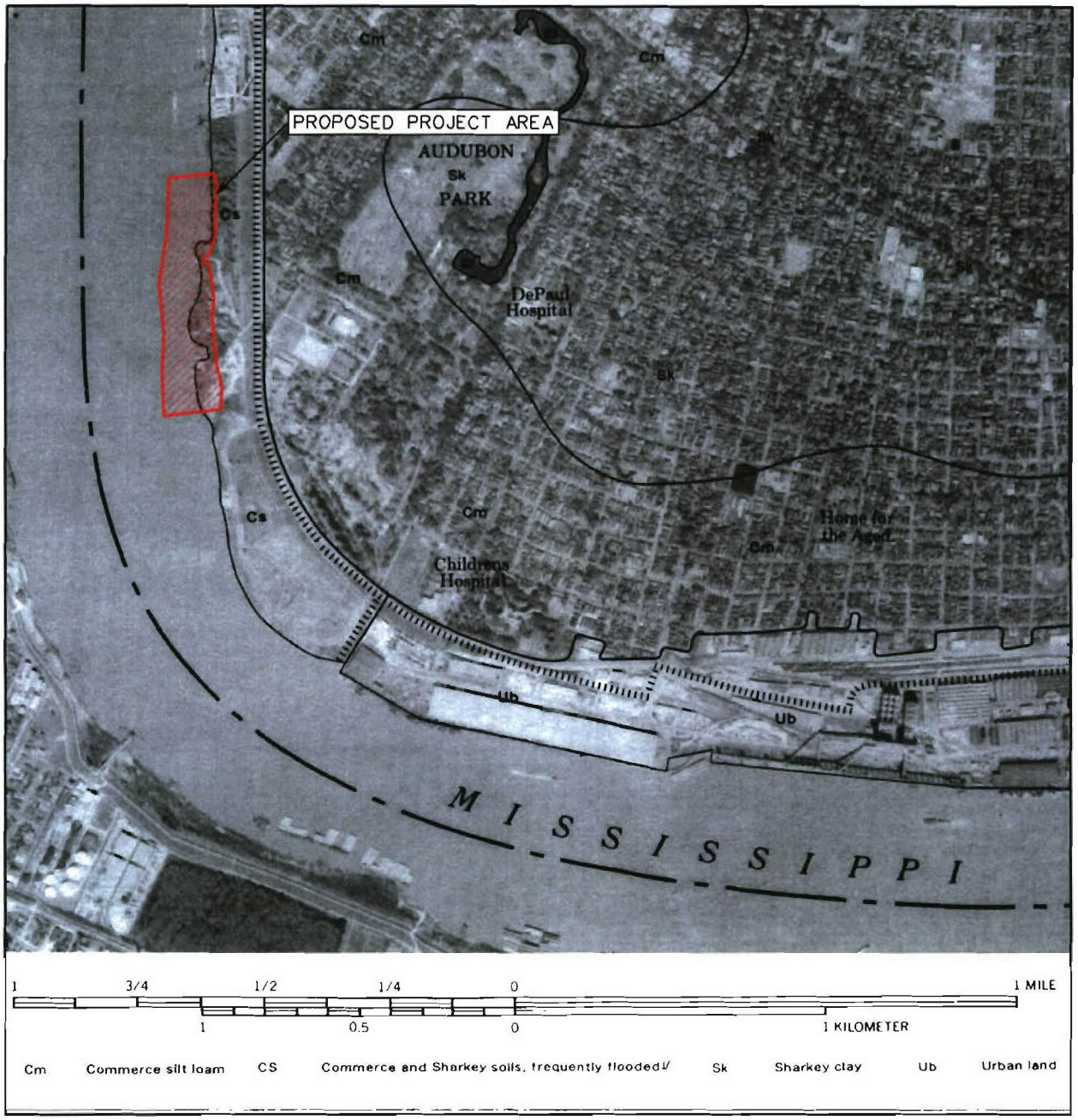


Figure 9. **Soils in the project area (modified from Trahan 1989).**

Table 4. Flora of the Natural Levee.

LATIN NAME	COMMON NAME
Quercus nigra	Water oak
Quercus lyrata	Overcup oak
Populus deltoides	Cottonwood
Liquidambar styraciflua	Sweetgum
Platanus occidentalis	Sycamore
Salix nigra	Black willow
Celtis laevigata	Hackberry
Forestiera acuminata	Swamp privet
Gleditsia aquatica	Water locust
Gleditsia triacanthos	Honey locust
Cephalanthus occidentalis	Buttonbush
Myrica cerifera	Wax myrtle
Sabal minor	Dwarf palmetto
Iva annua	Marsh elder
Sambucus canadensis	Elderberry
Ilex vomitoria	Yaupon
Campis radicans	Trumpet creeper
Rhus radicans	Poison ivy
Berchmis scandens	Rattan vine
Gramineae	Various grasses
Cyperaceae	Sedges

Table 5. Fauna of the Natural Levee.

LATIN NAME	COMMON NAME
Odocoileus virginianus	White-tailed deer
Sciurus carolinensis	Gray squirrel
Sciurus niger	Fox squirrel
Sylvilagus floridanus	Eastern cottontail
Sylvilagus aquaticus	Swamp rabbit
Ursus americanus	Black bear
Vulpes fulva	Red fox
Urcyon cinereoargenteus	Gray fox
Procyon lotor	Raccoon
Mustela frenata	Long-tailed weasel
Mustela vison	Mink
Felis rufus	Bobcat
Didelphis virginiana	Opossum
Mycocaster coypus	Nutria
Passerina cirris	Painted bunting
Agelaius phoenicews	Red-winged blackbird
Corvus brachyrhynchos	Common crow
Chordeiles minor	Common night hawk
Otus asio	Screech owl
Coragyps atratus	Black vulture
Cathartes aura	Turkey vulture

forests are painted bunting (*Passerina cirris*), red-winged blackbird (*Agelaius phoenicews*), common crow (*Corvus brachyrhynchos*), common nighthawk (*Chordeiles minor*), screech owl (*Otus asio*), black vulture (*Coragyps atratus*), turkey vulture (*Cathartes aura*), and many others. The oak forests are home for amphibians including salamanders, toads, tree frogs, and true frogs. The numerous reptiles found within the oak forests consist of a number of iguanids, skinks, lizards, snakes, pit vipers, and turtles (Lowery 1974a, 1974b; Penfound and Hathaway 1938).

Initially, large farms and plantations replaced the oak forests of the natural levees. As a result, the natural levees became covered with large tracts of sugarcane, cotton, rice, tobacco, indigo, and citrus trees. Later growth in the New Orleans area for industrial, business, and residential purposes has erased cropland and forests from the project area.

Flora and Fauna of the Inland Swamp

As is typical of any interdistributary area within the Mississippi Delta, inland swamp covers the area between the natural levees of the Mississippi River and the relict distributary ridge of the Bayou Sauvage Delta. To the west of the project area, the inland swamp grades into fresh and intermediate (brackish) marsh, and eventually into saltwater marsh (Kolb 1962; Kolb and Saucier 1982).

Prior to historic drainage and other disturbance, the inland swamp consisted entirely of freshwater wetland covered by water tolerant trees and aquatic understory plants. Shallow water covered this area throughout most or all of the growing season. The overstory of an undrained, inland swamp consists of varying proportions of bald cypress (*Taxiodium distichum*), tupelo gum (*Nyssa aquatica*), and one or more species of other gums (*Nyssa* sp.). Trees such as swamp blackgum (*Nyssa sylvatica* var.

biflora), swamp red maple (*Acer rubrum* var. *drummondi*), black willow (*Salix nigra*), pumpkin ash (*Fraxinus profunda*), green ash (*Fraxinus pennsylvanica*), water elm (*Planera aquatica*), water locust (*Gleditisia aquatica*), and Virginia willow (*Itea virginia*), also are common to the freshwater swamp. In addition, shrubs such as palmetto, buckrush (*Baccharis halimifolia*), buttonbush (*Cephalanthus occidentalis*), and numerous grasses were present. The most common grasses included alligatorweed (*Alternanthera philoxeroides*), common rush (Juncus sp.), maidencane (*Panicum hemitomom*), pickerelweed (*Potamogeton nodosus*), bulltongue (*Sagittaria latifolia*), and cattail (Typha sp.) (Craig et al. 1987; Penfound and Hathaway 1938) (Table 6).

The rich flora of an undrained freshwater swamp supports a diverse faunal population. It includes a variety of large reptiles and amphibians, and it provides habitat for large numbers of crawfish, bullfrogs, leopard frogs, water snakes, ducks, squirrels, alligators, wading birds, raccoons, mink, and otter. When the freshwater swamp is dry, it is inhabited by swamp rabbits, nutria, turkeys, and white-tailed deer. Small ponds and perennial streams within the freshwater swamp contain abundant freshwater fish (Penfound and Hathaway 1938; Trahan 1989).

Table 6. Flora of the Inland Swamp.

LATIN NAME	COMMON NAME
Taxiodium distichum	Bald cypress
Nyssa aquatica	Tupelo gum
Nyssa sylvatica var. *biflora*	Swamp blackgum
Acer rubrum var. *drummondi*	Swamp red maple
Salix nigra	Black willow
Fraxinus profunda	Pumpkin ash
Fraxinus pennsylvanica	Green ash
Planera aquatica	Water elm
Gleditisia aquatica	Water locust
Itea virginia	Virginia willow
Baccharis halimifolia	Buckrush
Cephalanthus occidentalis	Buttonbush
Alternanthera philoxeroides	Alligatorweed
Juncus sp.	Common rush
Panicum hemitomom	Maidencane
Potamogeton nodosus	Pickerelweed
Sagittaria latifolia	Bulltongue
Typha sp.	Cattail

Climate

The proposed project area has a humid subtropical climate with prevailing southerly winds. The long summers are hot and humid, and the winters are warm. The winters intermittently are interrupted by incursions of cool air from the north (Trahan 1989). The average annual normal rainfall within Orleans Parish is 150 cm (59 in). July, August, and September are the wettest months with a normal average precipitation that varies from 15.7 to 16.0 cm (6.19 to 6.32 in). October is the driest month with a normal average precipitation of 7.21 cm (2.84 in). The heaviest one-day rainfall at New Orleans for the period of record was 24.9 cm (9.8 in); it occurred on May 31, 1959. Rainfall and hurricane storm surge are the main causes of flooding within the vicinity of the proposed project area. The rainfall associated flooding results from either near-stationary cold fronts or hurricanes. Both situations are capable of producing rainfall at a rate of one or more inches per hour (Trahan 1989).

The movement of maritime tropical air masses from the Gulf of Mexico keeps temperatures within the project area from varying greatly. The average normal maximum annual temperature of this area is 25.2 ° C (77.4° F). During winter, the average normal maximum annual temperature is 54° Fahrenheit. The coldest month is January with an average maximum temperature of 16.4° C (61.5° F). During summer, the average normal maximum annual temperature is 32 ° C (90° F). The hottest month is July with an average maximum temperature of 32.4° (90.4° F). The lowest recorded temperature, which occurred at New Orleans on February 13, 1898, is -14° C (6.8° F). The highest recorded temperature, which occurred at New Orleans on June 27, 1967, is 39 ° (102° F) (Magill 1990:6; Trahan 1989; Peters and Beall 2002).

Archeological Implications

The geological history of the New Orleans area restricts the temporal range and distribution of archeological deposits. Before 6000 to 7000 BP, the proposed project area consisted of subaerially exposed coastal plain (Miller 1983; Saucier 1963). Therefore, both Paleo-Indian and Early Archaic cultures may have occupied the coastal plain in the vicinity of the project area.

Archeological deposits associated with these prehistoric cultures would have accumulated on the surface of this coastal plain; the surface is currently buried, and probably represents the partially truncated paleosol designated as the "First Weathering Horizon." During the Holocene transgression, shoreface and marine processes eroded this surface and its associated archeological deposits to varying degrees. The degree of truncation exhibited by an exposed section of the First Weathering Horizon as described by Miller (1983:90-92) indicates that the transgressive erosion failed to completely remove this paleosol from the surface of this buried coastal plain. Undoubtedly, the shallow depth of this erosion failed to impact this paleosol, which lies within the sediments filling the valleys cut into the former coastal plain.

Between 6000 and 3500 BP, the project area was open water, i.e., part of the Gulf of Mexico (Otvos 1978). During this period, the region was unavailable for occupation; therefore, Middle and Late Archaic archeological deposits should be absent from the area.

Aggradational sediments associated with the St. Bernard Delta Complex, and later natural levee deposits of the present Mississippi River course have accumulated in the general project area since 3400 BP; thus, archeological deposits of Poverty Point and later cultures are possible. The archeological deposits would be concentrated primarily within the natural levee of the Metairie Ridge that lies north and outside of the current project area. However, swamp and marsh deposits in the vicinity of the project area might contain archeological deposits associated with the natural levees of small, hypothetical crevasse and distributary channels radiating from the adjacent Metairie Ridge. The natural levee deposits of the Mississippi River could also contain archeological deposits. If present, these archeological deposits would consist of the sites of the Transitional Coles Creek and Plaquemine cultures.

Finally, alluvial deposition, lateral migration, and crevasse formation all affect the archeological record. Alluvial deposition and crevasse formation deposit layers of sedimentation onto archeological deposits, obscuring the locations of these deposits. Lateral migration destroys sites through cutting and erosion and covers sites through aggradation. These processes substantially alter the batture, and adversely affect archeological remains. Although riverine processes affect the morphology of the Mississippi River batture, flood control and river management construction have exerted more profound changes on the batture during the last century.

CHAPTER III

PREHISTORIC SETTING

Introduction

Louisiana's cultural tradition dates as far back as the Paleo-Indian period (ca. 10,000 B.C.). The cultural sequence of southern Louisiana traditionally has been divided into five stages: the Paleo-Indian, the Archaic (Meso-Indian), the Woodland (Neo-Indian), Mississippian, and the Protohistoric. However, as discussed in the previous chapter, geomorphological evidence indicates that the landforms in the project area are not more than ca. 2,000 years old. Consequently, sites dating from the Paleo-Indian or Archaic stages are not expected within the proposed project area. The following discussions of the Paleo-Indian and Archaic stages are provided as a prologue for introducing the Woodland cultures of the region.

Although information concerning Louisiana's rich prehistoric traditions can be found in a variety of other sources (Jenkins 1974; Muller 1983; Neitzel and Perry 1978; Neuman 1984; Smith et al. 1983; Webb et al. 1971), several studies in particular provide an overview of southern Louisiana prehistory. Neuman (1984) synthesized Louisiana prehistory, and summarized the findings of many of the larger archeological excavations conducted within the state. This work represents one of the most complete compilations of Louisiana prehistory to date. Some other state and regional studies also provide important overviews for understanding Native American settlement in Louisiana. Although Walthall (1980) emphasizes prehistoric development in Alabama, he also provides useful data on prehistoric occupation throughout the southeastern United States. Likewise, Jenkins and Krause (1986) discuss Mississippi and Alabama prehistory, but also present data applicable to southern Louisiana prehistory. Kniffen et al. (1987) describe historic Native American tribes in Louisiana, from their initial contact with early European explorers until the present.

Goodwin et al. (1991) provide the most complete discussion to date on geomorphological development in coastal Louisiana. This includes an analysis of the relationship between land formation and archeological site distribution, and site preservation and destruction processes. Following an overview of coastal Louisiana prehistory, that volume describes the interrelated geomorphic processes that affect land formation and deterioration. Applicable delta complexes are discussed, as are probable dates of formation. Recognized coastal zone geomorphic regions also are characterized. Finally, Goodwin et al. (1991) present a lengthy discussion focusing on the region's geoarcheology, the relationship between geomorphic processes, prehistoric settlement, and site preservation. Summary tables are provided that list anticipated geomorphic locations of surface and buried archeological deposits within identified physiographic regions; they also provide an assessment of expectations for buried and surface sites of different cultural components within described geomorphic regions. The current project area lies within Meander Belt No. 1 on the Mississippi River Alluvial Plain. As noted above, no sites dating from the Paleo-Indian or Archaic stages are anticipated. Although buried Poverty Point and Tchefuncte sites may occur within the project area, the oldest expected surface sites probably will have a Marksville affiliation.

The proposed project area lies within Management Unit V, as defined in *Louisiana's Comprehensive Archaeological Plan* (Smith et al.

1983:93-112) (Figure 10). This Management Unit is composed of 14 parishes located in the southeast portion of the state. *Louisiana's Comprehensive Archeological Plan* lists 25 cultural themes of interest or significance in the region (Smith et al. 1983:95-97). The entire management unit falls within the Holocene period alluvial deposits of the four major deltaic lobes that have shaped southeastern Louisiana. The Mississippi River alluvial valley dominates this management unit; it extends southeast from Pointe Coupee Parish to the mouth of the Mississippi River in Plaquemines Parish.

Following discussion of the state's six management units, Smith et al. (1983:127) summarized the 14 identified cultural units that comprise Louisiana's cultural development. Of these, the prehistoric cultural units that potentially could be located within the project area include: (1) Poverty Point, (2) Tchefuncte, (3) Marksville, (4) Troyville-Coles Creek, (5) Plaquemine, (6) Mississippian and (7) Historic Contact (Table 7). Relevant research themes are presented for each cultural unit, followed by a summary of known sites, and specific research and preservation goals. Evaluation of potentially significant archeological sites within Louisiana should be done within the context of the state archeological plan (Smith et al. 1983), and the site's known prehistoric or historic cultural development. An overview of the cultural development of the southeastern Louisiana area, from Paleo-Indian through Historic Contact, provides the context for evaluating prehistoric deposits identified within the project area. The historic development of the general project area is discussed in Chapter IV. To date, no prehistoric archeological sites have been recorded along the Mississippi River natural levee in the vicinity of the project area.

Table 7. General Prehistoric Chronology of Louisiana.

CULTURE	DATE
Paleo-Indian	**10,000 - 6000 B.C.**
Archaic	**6000 -1000 B.C**
Early	6000 B.C.- 5000 B.C
Middle	5000 B.C.- 3000 B.C.
Late	3000 B.C. - 1500 B.C.
Woodland Period	**1500 B.C. - A.D. 1700**
Poverty Point	1500 B.C. - 500 B.C.
Tchula/Tchefuncte	500 B.C. - A.D. 300
Marksville	A.D. 100 – 400
Troyville/Coles Creek	A.D. 400 – 1100
Plaquemine	A.D. 1100 – 1700
Mississippian	**A.D. 1000 – 1700**

Paleo-Indian Stage (10,000 - 6000 B.C.)

The initial human occupation of the southeastern United States generally is believed to have occurred sometime between 10,000 and 12,000 years ago (8000 - 10,000 B.C.). The earliest inhabitants to occupy this region have been termed the Paleo-Indians. In Louisiana, the earliest Paleo-Indian remains found date from 10,000 B.C. (Webb et al. 1971; Smith et al. 1983). Evidence of human occupation dating from this time period largely has been confined to upland areas (tertiary uplands or floodplain bluffs) in the northwestern part of the state. Furthermore, it is unlikely that Paleo-Indians occupied the project area, since habitable landforms did not exist in the project reach during this time. As a result, there is little probability of identifying evidence of Paleo-Indian occupation within the confines of the current project area. Nevertheless, a brief description of this stage is presented below as a context for subsequent cultural traditions.

The lithic tools characterizing the Paleo-Indian artifact assemblage suggest at least partial dependence on big game hunting. The tool kit includes large, thin, bifacially worked fluted lanceolate projectile points, bifacial cleavers, core handaxes, knives, drills, end scrapers, side scrapers, and spokeshaves (Smith et al. 1983). Lithic tools dating from this stage exhibit high quality workmanship, showing evidence of fine flaking, retouching, basal grinding, and thinning (Smith et al. 1983). Paleo-Indian projectile point types recovered from Louisiana include Angostura, Clovis, Dalton, Eden, Pelican, Plainview, San Patrice, Scottsbluff, and Quad.

Around 8000 B.C., a technological complex known as San Patrice first appeared in northwestern Louisiana, eastern Texas, and southern Arkansas (Webb et al. 1971). San Patrice sites date from 8000 to 6000 B.C. These sites initially were defined on the basis of two projectile point

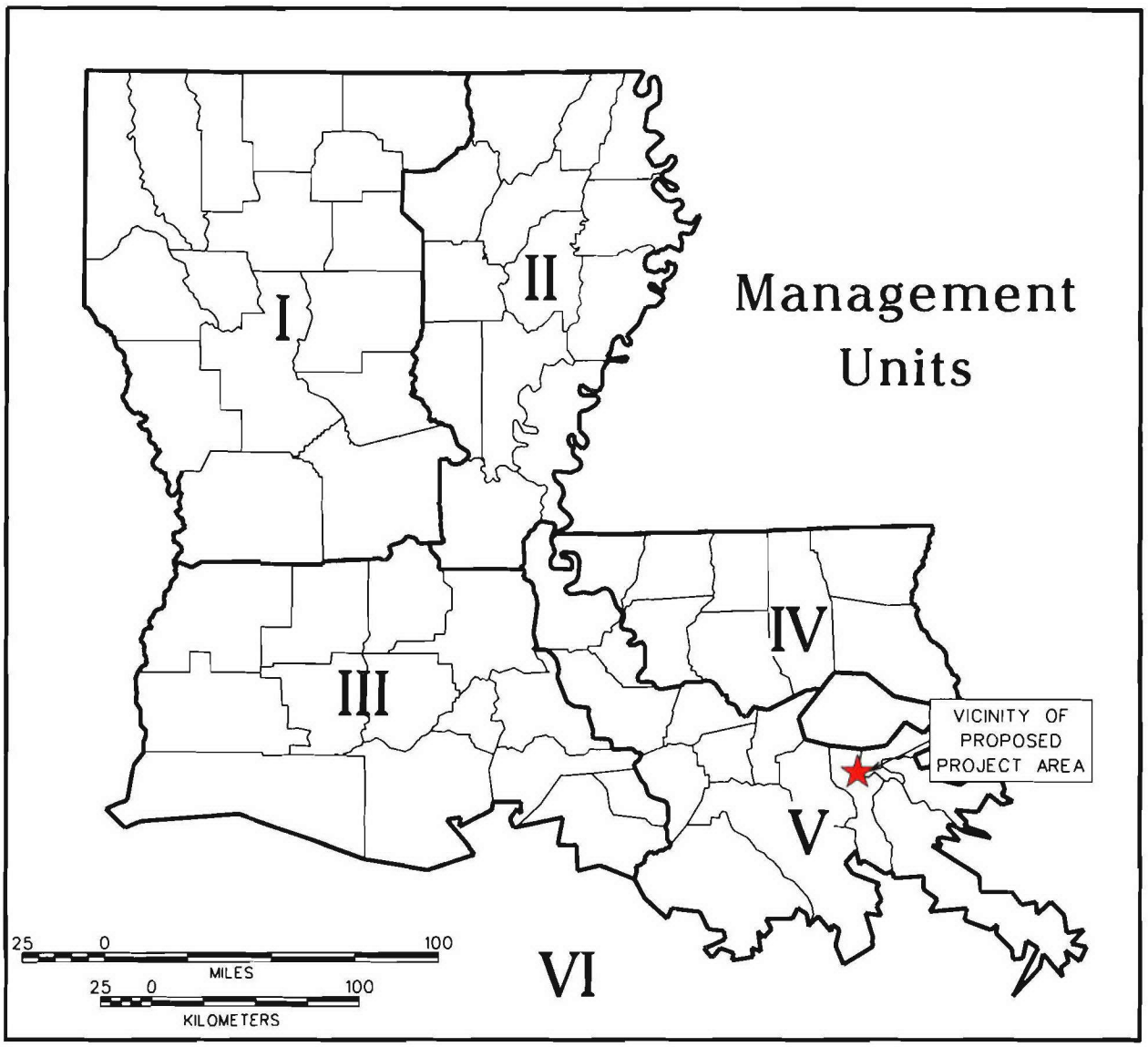


Figure 10. **Management Units in Louisiana.**

types: one lanceolate (San Patrice *var. Hope*), and one side-notched (San Patrice *var. St. Johns*) (Webb 1946). Unifacial tools such as Albany side scrapers and other side scrapers, end scrapers, gravers, drills, raclettes, scaled pieces, burins, and retouched flakes also compose the San Patrice tool inventory (Webb et al. 1971). San Patrice sites appear to have been contemporaneous with Dalton complex occupations recognized in adjacent states. Close technological and morphological affinities between the San Patrice and Dalton complexes have led some archeologists to suggest that these sites are related and comprise the Dalton horizon (Ensor 1986).

Paleo-Indian peoples are considered by some researchers to have been mobile hunter-gatherers organized in small bands or extended family groups. Many models suggest that Paleo-Indian populations were specialized big game (megafauna) hunters. The co-occurrence of Pleistocene megafauna and several Paleo-Indian projectile points (see Brush and Smith 1994; Clausen et al. 1979; Webb et al. 1984) has led most researchers to accept the interpretation that southeastern Paleo-Indian peoples fulfilled at least a portion of their subsistence requirements by hunting and/or scavenging megafauna, including bison, mammoth and mastodon, that were present on the North American continent at the end of the Pleistocene (Anderson and Sassaman 1996). This interpretation, however, has been modified as additional data have been recovered from the controlled excavations at additional Paleo-Indian sites. While sufficient evidence exists to document the exploitation of large mammals (e.g., mammoth, mastodon, bison, caribou, and elk) at sites in the western and northern United States, kill sites in the Southeast are rare.

Most of the archeological evidence associated with the Paleo-Indian occupation of the southeastern region is limited to surface finds of diagnostic projectile points/knives (Mason 1962). In the Lower Mississippi Valley, Paleo-Indian projectile points/knives have been recovered along valley margins but rarely in the alluvial valley or along the coastal plain. Distributional studies indicate that Paleo-Indian sites in the eastern United States tend to be located on eroded terrace and plateau surfaces (Walthall 1980).

The settlement of Paleo-Indian peoples in the Lower Mississippi Valley is best documented from Maçon Ridge in northeast Louisiana. Hillman (1985) provided a prehistoric overview of the Paleo-Indian stage at Maçon Ridge that suggests that continuous human occupation of the ridge began sometime around 8000 B.C. Temporally diagnostic projectile points/knives identified at Maçon Ridge date from the Early Paleo-Indian period (Clovis, Sandia II, and unfluted lanceolate points), the Middle Paleo-Indian period (Plainview, Scottsbluff, Quad, Hell Gap, and Pelican), and the later, transitional, "Epipaleoindian" period (Dalton, Hardin, and San Patrice projectile points). The latter period, i.e., the Epipaleoindian, originally was used by Gibson (1982) to discuss the transitional period between the Late Paleo-Indian and Early Archaic periods.

The distribution of recorded sites on Maçon Ridge suggests that this area was occupied more intensively during the Late Paleo-Indian period. Sites dating from the Late Paleo-Indian period, like hunting camps and base camps, typically occur very close to streams, ponds, or sloughs, and on landforms that generally are no more than 1 m (3.3 ft) in elevation above the water source. This pattern may indicate a preference for the wooded fringes along the waterways rather than open grasslands. In contrast, Early Archaic period sites usually occur on higher elevations; this shift may reflect a transformation in the natural setting of Maçon Ridge from open grassland to open woodland (Hillman 1990).

Near the end of the Pleistocene, the climate warmed and the herds of megafauna declined, forcing aboriginal peoples to adapt to the developing environment of the region. The late Paleo-Indian tool assemblage reflects this adaptation. While the early Paleo-Indian tool assemblage consisted primarily of projectile points manufactured from exotic materials, late Paleo-Indian tools included knives, scrapers, chisels, gravers, drills, and adzes, most of which were made from locally available materials. In addition, overall projectile point size decreased, indicating a greater reliance on smaller game, such as deer. While the transition from the Paleo-Indian to the Archaic stage was gradual, and likely occurred sooner in some areas than others, by about 6000 B.C., the transition was complete.

Distributional studies show that Paleo-Indian sites in the eastern United States tend to be located on the eroded surfaces of terraces and plateaus; more fluted points have been recovered from the highlands of Tennessee and Kentucky than anywhere else in North America (Walthall 1980:26). In Louisiana, Paleo-Indian sites may be found in the Tertiary uplands and the upland/floodplain bluffs (Guy and Gunn 1983). These sites are characterized by surface finds of Clovis, Folsom, Scottsbluff, Plainview and other early projectile point types. Although the majority of these projectile points/knives have been recovered from northern Louisiana, a few have been collected from late Pleistocene age Prairie Terrace deposits and salt domes in southern Louisiana. No projectile points have been located in the major river drainages to the south and east because near surface deposits in these areas are geologically too young to include Paleo-Indian strata. No Paleo-Indian sites have been identified south of Lake Pontchartrain in the vicinity of New Orleans.

Archaic Stage (6000 - 1500 B.C.)

The Archaic stage is characterized by a more diversified hunting and gathering subsistence system than evidenced by the Paleo-Indian stage (Neitzel and Perry 1978). The size, content, and distribution of Archaic sites suggest that site occupation corresponded to seasonal availability of select natural resources. Archaic peoples exploited a home range delimited by the seasonal availability of nuts, fruits, fish, game, and other natural resources (Muller 1983). Populations continued to expand, as evidenced by the increased number of sites dating from the Archaic stage. Macrobands were common during spring and summer; however, during winter, they split into microbands to exploit nearby upland ranges (Jenkins 1974; Muller 1983). There also is evidence that a greater variety of faunal and floral species were exploited during the Archaic stage than during the Paleo-Indian stage, with utilized fauna including raccoon, opossum, dog, groundhog, squirrel, fox, beaver, bear, wildcat, rabbit, skunk, chipmunk, mink, muskrat, otter, porcupine, wild turkey, turkey vulture, passenger pigeon, goose, turtle, snake, and deer. The previously exploited megafauna were extinct by this time (Neuman 1984).

The Archaic generally is broken into three subdivisions: Early Archaic, Middle Archaic, and Late Archaic. The Early Archaic represents a change in subsistence patterns. While Paleo-Indians exploited Pleistocene megafauna, the Early Archaic Native Americans utilized a wider variety of resources. Spurred by the extinction of Pleistocene megafauna, the economy was expanded to include extensive gathering as a supplement to the hunting of smaller game. Late Paleo-Indian and Early Archaic projectile point styles such as Angostura-like, San Patrice, and Dalton have been found throughout Louisiana; however, very few Early Archaic components have been isolated within the state.

Early Archaic Period (6000 - 5000 B.C.)

Within the southeastern United States, the Early Archaic stage (6000 - 5000 B.C.) is subdivided into four chronological horizons: the Dalton Horizon, the Big Sandy Horizon, the Kirk Horizon, and the Bifurcate Horizon (Walthall 1980). The earliest of these, the Dalton Horizon, is thought to be a transition from the Late Paleo-Indian and Early Archaic. This horizon is generally restricted to the eastern United States, south of the Ohio Valley. The Dalton Horizon tool assemblage includes small to medium-sized lanceolate to pentagonal-shaped projectile points with serrated edges; grinding often is present around the hafting portions of these points. Resource procurement was directed towards the exploitation of riverine faunal and floral species (Muller 1983; Walthall 1980). In Louisiana, artifacts associated with the Dalton Horizon usually are restricted to the northern portion of the state.

Side-notched projectile points with steep triangular blades and serrated edges characterize the Big Sandy Horizon. Side-notching and utilization of a similar chipped stone tool assemblage suggests continuity with Dalton and San Patrice. Big Sandy sites also exhibit multiple activity areas (Walthall 1980). Big Sandy projectile points are spread over a wider area than those of the Dalton Horizon, extending from Arkansas to Florida, and north to the Great Lakes region (Walthall 1980). The Kirk Horizon is characterized by medium-sized, corner-notched projectile points with deep serrations along the blades. This horizon extends throughout the forested regions of the eastern United

States, suggesting an adaptation to a forested environment (Walthall 1980). A substantial inventory of wood and bone working tools is associated with Kirk Horizon sites (Purdy 1973; Waller 1976). Small, bifurcated-stem projectile points identify the Bifurcate Horizon; the blade edges usually are serrated. Distribution of these points throughout the eastern United States is similar to the distribution of points of the preceding Kirk Horizon (Walthall 1980).

Middle Archaic Period (5000 - 3000 B.C.)

The Middle Archaic is characterized by the interaction of three interrelated events. First, the effects of continental glaciation decreased throughout the Early Archaic, resulting in a warmer and drier climate. By 4000 through 3000 B.C., modern climatic and environmental conditions were established. Second, increased sedentism and a reduced range corresponded with developing regional diversification. Finally, technological developments occurred during the Middle Archaic, especially with groundstone, bone, and antler implements. The Middle Archaic artifact assemblages of the southeastern cultural area are characterized by a plethora of stemmed, broad-blade projectile points; these probably were used in conjunction with the *atlatl* (spear thrower). Middle Archaic projectile points recognized from sites in northwestern Louisiana, northeastern Texas, and southwestern Arkansas include Yarbrough, Yantis, Palmillas, Kent, Elam, Keithville, Carrollton, and Morrow Mountain varieties. Heavy grinding and nutting stone tools and tools such as axes, adzes, wedges, and gouges indicate that Middle Archaic peoples were well-adapted to southern hardwood forests. Bone fishhooks, net sinkers, and plummets reflect increasing reliance on aquatic resources.

Large floodplain sites containing thick midden deposits represent quasi-permanent or permanent habitations that characterize the settlement pattern of this period. These sites are augmented by small special activity sites that are generally located on floodplains, on terraces, and in upland settings along tributary streams. These sites apparently were chosen for their proximity to selected exploitable resources, including game, nuts, and chert.

A Middle Archaic manifestation recognized in South Louisiana is the Amite River phase. The Amite River phase was defined in the Amite Basin in the upper deltaic region of Louisiana (Gagliano 1963). It represents an adaptation to the upland woodlands, and it is characterized by earth middens and camp areas that may include conical earth mounds. Sites are located on stream valley margins and along beaches and estuaries. Ground stone and bone commonly were used for manufacturing a variety of tools. Local gravels served as a source for chipped stone artifacts (Gagliano 1967). Williams, Shulma, Kent, Wells, Almagre, and Gary projectile point types were common.

Late Archaic Period (3000 - 1500 B.C.)

The Late Archaic period is marked by the settlement of previously uninhabited or sparsely populated areas, suggesting an increase in population throughout the Southeast. Macrobands made up of approximately 30 or more people were formed during spring and summer months and dividing into microbands to exploit nearby environments during the winter months (Jenkins and Krause 1986; Muller 1983). Stone vessels made from steatite and fiber-tempered pottery are hallmarks of the Late Archaic. Projectile point types recognized from southern Louisiana include various expanding, contracting, and straight stem forms: Yarbrough, Carrollton, Gary, Shulma, Palmillas, Morhiss, Kent, Pontchartrain, Marshall, Webb, Hale, Ellis, Marcos, Wells, Williams, and Frazier. Shell, bone and stone pendants, musical tube pipes, and a variety of other artifacts are associated with the Late Archaic. During the Late Archaic, regional variations intensified, and extensive exchange relationships developed between regions. Subsistence practices were scheduled around the seasonal availability of key species; deer, fish, nuts, and shellfish were of primary importance. Late Archaic peoples probably practiced limited horticulture of such native cultigens as sunflower, marsh elder, and various gourds and squashes. Typical Archaic site locales include boundary Quaternary and Tertiary areas with relatively flat or undulating bluff tops overlooking floodplains.

Mounds appeared during the Late Archaic some time before 2000 B.C. (Gibson and Shenkel 1988:9-10). Saunders et al. (1992) believe that mounds erected during this time period are datable based on the age of the landforms, the

eluviation of fill clays from the A and E horizons to the Bt Horizon, and a lack of post Archaic artifacts. At present, only four possibly Late Archaic mounds or mound complexes have been identified in northern Louisiana (Saunders et al. 1992). These include the Hedgepeth Mounds (Site 16LI7), the Watson Brake Mounds (Site 16OU175), the Frenchman's Bend Mounds (Site 16OU259), and Hillman's Mound (Site 16MA201).

Late Archaic period projectile point/knife types are commonly found throughout Louisiana. However, very few discrete and intact archeological deposits dating from this time period have been excavated systematically, analyzed, and comprehensively reported (Neuman 1984). Late Archaic sites in the west-central and northern parts of the state that have been studied systematically have produced projectile point/knife types that include Bulverde, Carrollton, Delhi, Ellis, Ensor, Epps, Gary, Kent, Macon, Marcos, Palmillas, Pontchartrain, Sinner, and Yarbrough types. Groundstone objects recovered from these sites include celts/axes, plummets, and steatite bowl fragments (Campbell et al. 1990; Jeter et al. 1989; Smith 1975). Additionally, there is evidence for widespread trade in shell, copper, slate, greenstone, and jasper ornaments, including carved stone zoomorphic locust beads, during Late Archaic times (Blitz 1993; Brose 1979; Smith 1986:31; Steponaitis 1986:374).

Woodland Stage (1500 B.C. - A.D. 1700)

The Woodland stage is composed of seven distinct cultural units. These include Poverty Point, Tchefuncte, Marksville, Troyville-Coles Creek, Caddo, Plaquemine, and Mississippian cultures. These cultural units generally date between 1500 B.C. to historic contact. This stage is distinguished from the preceding Archaic stage by the introduction and eventual widespread use of pottery. While pottery initially was used by Poverty Point cultures, its use increased with the subsequent Tchefuncte culture. Because of this, Poverty Point normally is considered to be a transitional period, possessing characteristics of both the Archaic and the Woodland stages. Other cultural developments also differentiate Woodland settlements from the preceding Archaic sites. Woodland sites often are larger than Archaic sites, suggesting both increased population densities and increased sedentism. In addition, several important technological and cultural developments occurred during the Woodland stage. These included the introduction of the bow and arrow, widespread use of agriculture, and large scale mound construction. Technologies were introduced and diffused throughout the southeast, creating analogous artifact inventories with regional distinctions.

Poverty Point Culture (1500 - 500 B.C.)

Both the Poverty Point period and culture are named after the type site (16WC5) located in West Carroll Parish, Louisiana. The Poverty Point culture is characterized by the appearance of baked clay balls, a microlithic stone tool industry, and extensive earthworks (Ford and Webb 1956; Kuttruff 1975; Webb 1968). At the time of its construction, the Poverty Point site was the largest earthwork in the Americas. The site is octagonal in shape and composed of six segmented ridges measuring 15.2 to 45.7 m (50 to 150 ft) in width. Several other Poverty Point mounds are scattered throughout the immediate site area. The largest of these, Mound A, was constructed to resemble a bird effigy. Numerous clay balls recovered from the site have been identified as "cooking balls," thought to have been used to warm liquids; these objects appear to represent substitutes for stone, which is scarce in the lower Mississippi River Alluvial Valley. Poverty Point artifacts reflect an increase in exchange activity, which began during the Middle and Late Archaic periods. The artifact assemblage at Poverty Point includes tools and resources made from raw materials originating from Alabama, Arkansas, Tennessee, Ohio, Indiana, and Illinois; steatite vessels originating from Georgia and North Carolina; and, copper originating from Michigan. Fiber-tempered ceramics appear later in the period. In addition, the presence of non-utilitarian items, i.e., lapidary work, panpipes, and animal effigies in stone and shell, as well as massive civic-ceremonial architecture, suggest a hierarchical social organization.

The Poverty Point culture exhibits a well-developed chipped and groundstone lithic technology. This technology reflects both the paucity of lithic deposits within the Lower Mississippi Alluvial Valley and the availability of exotic lithic material acquired through the extensive

trade network. In addition to the lapidary work, Poverty Point peoples made a variety of elaborate tools that melded both function and aesthetics. Groundstone tools included hematite and magnetite plummets, atlatl weights, and gorgets. Chipped stone tools included well-made points and microtools, i.e., small stone tools normally under 2.5 cm (1 in) in length (Neuman 1984; Smith et al. 1983).

Very little subsistence information has been obtained from the Poverty Point site itself. Gibson (1978) suggests that redistribution, or the centralized collecting and reallocation of economic produce during Poverty Point times, represents an alternative to seasonal movement; in this manner, the need for food year round was met. Analysis of faunal remains recovered from the Poverty Point component of the nearby J. W. Copes Site (16MA47) unequivocally indicates a hunting and foraging economy (Jackson 1986; 1991). Specialization in the procurement of deer and fish continued from Late Archaic times.

Distributional studies show that Poverty Point sites were located in areas ideal for the intensive exploitation of forest-edge resources. Poverty Point sites typically are distributed linearly along the Mississippi River Valley and three of its major tributaries: the Arkansas River, the Ouachita River, and the Yazoo River. Typical Poverty Point locations include Quaternary terraces or older land masses overlooking major stream courses, major river levees of active or relict river channels, river/lake junctions, and coastal estuaries or older land surfaces located in the coastal marsh (Neuman 1984; Gagliano and Saucier 1963). The position of the Poverty Point type site on Maçon Ridge overlooking Bayou Maçon has led some to suggest that the location of the site allowed the inhabitants to exploit, if not control, the flow of trade goods between other communities (Muller 1983; Neitzel and Perry 1977; Smith et al. 1983). Poverty Point sites along the Vermilion River in Lafayette Parish are believed to be representative of a number of chiefdoms responsible for the coordination and redistribution of resources in that area (Gibson 1974). The percentage of inhabitants of the coastal area participating in Poverty Point culture remains uncertain.

In southeastern Louisiana, Bayou Jasmine and Garcia phase sites represent Poverty Point period occupations that exhibit a continuation of the earlier Archaic culture, with the addition of Poverty Point traits. Both phases are characterized by seasonal and specialized adaptations to marsh environments. Bayou Jasmine phase sites are located on the western shore of Lake Pontchartrain, as well as along natural levee ridges of the Mississippi River distributaries. This phase, named after the Bayou Jasmine site (16SJB2) in St. John the Baptist Parish, is typified by *Rangia* shell and earth middens, by an artifact assemblage that includes Poverty Point baked clay objects, by a lithic subassemblage that does not exhibit the classic Poverty Point microlithic assemblage, and by the use of bone artifacts. Pontchartrain projectile points occasionally are recovered from these sites. Faunal remains recovered from Bayou Jasmine sites include small animals, such as muskrats, birds, and fish, as well as some deer and bear. Radiocarbon dates from Linsley (16OR40), a Bayou Jasmine phase shell midden located south of Lake Pontchartrain, cluster around 1740 B.C., very early in the Poverty Point sequence (Gagliano 1963). A series of radiocarbon assays also indicates that the Claiborne site (22HA35), at the mouth of the Pearl River, is quite early, older perhaps than the Poverty Point site itself (Bruseth 1991).

Bayou Jasmine (16SJB2) was discovered in the late 1950s during road construction. Much of the site was buried beneath 1.8 - 2.4 m (6 - 8 ft) of marsh and swamp deposits, along a submerged natural levee of a former Mississippi River tributary, near its mouth at Lake Pontchartrain. Artifacts from the site were collected from the associated construction spoil piles. The limited data collected at that time formed the basis for the Bayou Jasmine phase of Poverty Point (Duhe 1976; Gagliano 1963; Gagliano and Saucier 1963). In 1974, the site was rediscovered during construction of Interstate 55. Based on field observations, the site extended along either side of the bayou for a distance of at least 91 m (300 ft), and back from the bayou for at least 18 m (60 ft). The observed shell deposits measured 5.5 to 6.1 m (18 to 20 ft) in thickness. Numerous artifacts were collected from spoil piles along a work canal (Duhe 1976). Limited subsurface testing was conducted within a 2.1 by 15 m (7 by 50 ft) steel piling cofferdam, which was con-

structed around the excavation area (Neuman 1976). Based on the analysis of collected faunal and floral remains, the shell midden appeared to represent a seasonal coastal occupation, which probably was utilized during the summer months. Numerous fish, turtle, and alligator remains were collected, along with a substantially smaller percentage of mammal remains. Very few bones from migratory birds such as geese and ducks were recovered, suggesting limited late fall and winter occupation of the site (Duhe 1976).

A large quantity of bone fishing equipment was recovered from Bayou Jasmine, along with some wood and plaited cordage. This equipment included fish hooks, fish gorges, fishing line weights, bone projectiles, perforated harpoons, a harpoon finger rest, harpoon float neck valve plugs, and a carved wooden spool probably used for holding cordage. Clay cooking balls also were common. A small quantity of lithic material was recovered, including flake tools and Jaketown perforators. The flakes probably were used for processing the riverine resources. A few items made of non-local materials were recovered. These included two hematite objects (a bead and a probable plummet), a few quartz crystals, and steatite. Three human burials, and an associated dog burial, were located. Duhe (1976) concluded that this site was a seasonal (summer) fishing station, supplemented with harvesting of *Rangia cuneata*, and limited hunting of small mammals and deer. Data from this site provide the most complete information about coastal Poverty Point sites collected to date.

Garcia phase sites are located along the eastern shore of Lake Pontchartrain. The Garcia site (16OR34), the type site for the Garcia phase, contained a beach deposit of *Rangia* shells and midden debris. While no dates have been obtained for the Garcia phase, an artifact comparison with other Poverty Point sites suggests that this phase post-dates the Bayou Jasmine phase (Jeter and Williams 1989). The Garcia phase artifact assemblage differs substantially from the earlier Bayou Jasmine assemblage. Although the assemblage lacks Poverty Point baked clay objects, it includes a typical Poverty Point lithic complex. Associated projectile points include Pontchartrain, Gary, and Macon points, as well as a number of other projectile point types. Various cores and blades, large flake scrapers, groundstone objects, schist and gneiss slabs, quartz crystals, cut bone, and non-local lithic materials also are common (Gagliano 1963; Gagliano and Saucier 1963).

Tchula Period/Tchefuncte Culture (500 B.C. - A.D. 300)

Equated with the Tchefuncte Culture, the Tchula period is characterized by the first widespread use of pottery, albeit in the context of a Late Archaic-like hunting and gathering tradition and with a Late Archaic-like tool inventory (Neuman 1984; Smith et al. 1983). While the extensive inter-regional trade network associated with the Poverty Point culture may have broken down, an increase in population and an intensification of intra-regional relationships became established during the Tchula period. The Tchefuncte culture was identified at the Tchefuncte Site (16ST1) on the north shore of Lake Pontchartrain, in St. Tammany Parish (Ford and Quimby 1945; Rivet 1973; Weinstein and Rivet 1978).

The Tchula period is characterized by the first widespread use of pottery in the Lower Mississippi Valley (Ford and Quimby 1945). Lacking local antecedents in Louisiana, Tchefuncte ceramics may have originated from the Stallings Island and Orange complexes of the Georgia-Florida coast (Speaker et al. 1986). Tchefuncte ceramic assemblages include both plain and decorated wares with soft and chalky paste. Fabric and cord impressions, punctations, narrow and wide line incisions, and simple rocker stamping decorations commonly appear on these vessels. A variety of vessel forms occur, many with flat bases or with foot supports. Tchefuncte Plain, Tchefuncte Incised, Tchefuncte Stamped, Lake Borgne Incised, Orleans Punctated, and Tammany Punctated are common soft-paste ceramic types. Alexander Incised and Alexander Pinched are two common sand tempered wares (Toth 1977; Rivet 1973). The distribution of these ceramic styles also suggests widespread interaction throughout the Lower Valley and with groups located to the east. The introduction of pottery undoubtedly brought innovations in food preparation and changes in eating habits (Neuman 1984).

Late Archaic or Poverty Point projectile point types found in Tchefuncte contexts include Gary, Ellis, Delhi, Motley, Pontchartrain, Macon, and Epps (Smith et al. 1983). Tchefuncte assemblages also include boatstones, grooved plummets, mortars, sandstone saws, bar weights, scrapers, and chipped celts. Socketed antler points, bone awls, fishhooks, and bone ornaments also are associated with Tchefuncte components.

In southeastern Louisiana, Tchefuncte sites generally consist of shell middens located on the higher portions of the natural levees, cheniers, and lakeshores. Tchefuncte sites have been classified as coastal middens or inland villages and hamlets. Settlements reflecting coastal adaptations usually are located near the slack-water environments of slow, secondary streams that drain the bottomlands, floodplain lakes, and in littoral settings (Neuman 1984). Coastal site locations seem best suited for exploiting a variety of fresh and brackish water resources (Shenkel 1984), particularly *Rangia cuneata*. Inland sites were oriented towards exploitation of terrace and floodplain habitats; they were less reliant on brackish water resources (Shenkel 1984).

The majority of coastal Louisiana Tchefuncte sites are clustered within the Pontchartrain Basin in the southeast, and around Grand Lake in the southwest. In the Pontchartrain Basin, the sites generally are situated on natural levees and relict beach ridges such as the New Orleans Barrier Island Trend south of Lake Pontchartrain. Dominant Tchefuncte sites excavated south of Lake Pontchartrain include Little Woods Middens (16OR1-5) and Big Oak Island (16OR6). The Little Woods Middens consisted of a series of five shell middens located a short distance south of Lake Pontchartrain. The middens were reported while they were being mined for shell, at which point numerous artifacts and human burials were observed. During salvage excavations, two cultural horizons were identified. The basal Tchefuncte shell midden horizon varied from 0.3 to 2.1 m (2 to 7 ft) in thickness; it was capped by an approximately 45 cm (1.5 ft) thick Coles Creek midden. In addition to numerous artifacts, eight Tchefuncte burials were excavated. Six of these burials were primary flexed burials; one was associated with two quartz crystals. The remaining two burials included an extended burial, and an isolated skull. Unfortunately, project field notes and much of the recovered material were misplaced, and remaining artifacts were combined into a single collection (Neuman 1984).

In 1939, limited testing was conducted at Big Oak Island (16OR6); the site was located in a marsh environment northeast of New Orleans. The site consisted of a 220 x 23 m (725 x 75 ft) crescent-shaped shell midden, which extended to 2.7 m (9 ft) above the surrounding marsh. In addition to considerable amounts of artifactual material, primary flexed burials apparently were recovered from the site. A thorough discussion of the excavations, including the burials, was not prepared.

Two Tchefuncte phases are identified within southeastern Louisiana: the Pontchartrain and Beau Mire Phases. The Pontchartrain Phase encompasses the margins of Lake Pontchartrain and Lake Maurepas. It is characterized by a variety of poorly made sandy wares, including Tammany Punctated, *var. Cane Bayou*, Tchefuncte Plain, *var. Mandeville*, Tchefuncte Stamped, *var. Lewisburg*, Tchefuncte Incised, *var. Abita Springs*, Lake Borgne Incised, *var. Ponchitolawa*, and Mandeville Stamped, *var. Mandeville*. Other artifacts include Pontchartrain and Kent projectile points, clay tubular pipes, bone points, and some Poverty Point-like clay cooking balls (Jeter et al. 1989). Several Pontchartrain Phase sites have been investigated, including Little Woods Middens (16OR1-5); Tchefuncte (16ST1) (Ford and Quimby 1945); Big Oak Island (16OR6) (Ford and Quimby 1945; Shenkel 1974, 1980, 1981; Shenkel and Gibson 1974); Little Oak Island (16OR7) (Ford and Quimby 1945; Shenkel 1974, 1980, 1981); and a component of the Bayou Jasmine site (16SJB2) (Duhe 1976).

The Beau Mire Phase was identified by Weinstein and Rivet (1978) at the Beau Mire site (16AN17), located west of Gonzales along New River. Earth midden sites situated along relict Mississippi River meanders or distributaries, including crevasse distributaries, characterize this phase. The Beau Mire site is a late Tchefuncte phase site, probably post-dating the Pontchartrain Phase.

Marksville Culture (A.D. 100 - 400)

Named for the type site at Marksville (16AV1) in Avoyelles Parish, Louisiana, the Marksville culture often is viewed as a localized version of the elaborate midwestern Hopewell culture. The arrival of Hopewellian influence in the Lower Mississippi Valley is marked by the widespread and apparently sudden presence of conical mounds, ceramics, and Hopewellian status-related artifacts. The similarities between Marksville and Hopewell cultures in pottery manufacture and decoration, mound construction, and burial patterns are so strong that some conclude that Hopewellians actually migrated to the Marksville culture area (Muller 1983).

Marksville culture is marked by an intensification of ritual associated with mortuary activities, and resurgence in inter-regional exchange of prestige items (Cantley et al. 1984). Many Marksville sites exhibit modified forms of the Hopewellian mortuary complex. While the Marksville economic base retained the hunting, fishing, and gathering subsistence strategy of earlier periods, a non-egalitarian social organization is implied by complex construction and mortuary practices. These include geometric earthworks, conical burial mounds for the elite, and a unique mortuary ritual system. Construction of conical burial mounds was widespread during early Marksville times. While incorporating some elements characteristic of Hopewellian culture, Marksville mortuaries also retained distinctive, localized traits. Marksville burial practices apparently are continuations of previous patterns onto which a few elaborations of the Hopewellian culture were grafted. While large quantities of grave goods are not common at Marksville sites, some items, such as Hopewellian-type platform pipes, were found at Marksville and were manufactured primarily for inclusion in burials. Mortuary practices became less complex as Hopewellian influence on the culture declined (Smith et al. 1983:171; Speaker et al. 1986:40).

Ceramics generally were tempered with clay particles and smaller amounts of sand and grit. Early Marksville ceramics of the Lower Mississippi River Valley do not represent a significant advance in ceramic technology when compared to late Tchefuncte manufacture. There is strong continuity between Tchefuncte and Marksville ceramics with regard to those attributes pertaining to paste and shape. Most new motifs and decorative treatments can be traced to the Illinois Valley, where several roughly contemporary phases produced strikingly similar Hopewell style pottery (Toth 1977).

Decorative motifs shared by Marksville and Hopewell ceramics include cross-hatching, U-shaped incised lines, zoned, dentate rocker stamping, cord-wrapped stick impressions, stylized birds, and bisected circles (Smith et al. 1983). Crosshatched Marksville rims and the raptorial bird motif, combined with the tubby pot vessel mode, constitute the most distinctive decoration found in early Marksville ceramics. Judging from recovered whole vessels, the two most popular versions of the raptorial bird motif consist of a very stylized representation featuring a long, curved neck and a head inclined upward. A few of these vessels were colored with a red pigment, presumably hematite, on their exteriors, but most were buff to brown or gray and black.

Utilitarian material culture changed little from earlier periods, reflecting overall continuity. Other Marksville culture traits include a chipped stone assemblage of knives, scrapers, and drills; ground stone atlatl weights and plummets; bone awls and fishhooks; baked clay balls; and Gary projectile points. Stone artifacts recovered from Marksville sites include medium to large stemmed projectile points, atlatl weights, chipped celts, and drills (Smith et al. 1983:172). Exotic items, which almost always are recovered from burials, include pearl beads, carved stone effigy pipes, copper ear spools, copper tubes, galena beads, and carved coal objects (Neuman 1984; Smith et al. 1983). Since native copper is foreign to the Lower Mississippi Valley, copper found at early Marksville sites was imported, presumably in the form of finished products manufactured in the northern Hopewellian centers. The best examples of copper objects are a panpipe and copper earspool from Helena Crossing (3PH11), and copper earspools from the Crooks site (16LA3). Panpipes, copper jacketed panpipes or conjoined tubes as they sometimes are called, are among the most specialized and diagnostic of all Hopewellian status related artifacts. Copper earspools are one of the more common artifacts found in

mortuary contexts at Hopewell or Hopewell influenced sites in the eastern United States. They take the form of a spool shaped object measuring 3 to 6 cm (1 to 2 in) in diameter that also are referred to as bi-cymbal copper earspool. These items reflect extensive trade networks and possibly a ranked, non-egalitarian society (Toth 1988).

The primary raw materials that may have been imported by early Marksville societies include mica, galena, marine shells, freshwater pearls, large carnivore canines, and greenstone. Some of these items, such as freshwater pearls and carnivore canines, are not necessarily imported, while other items are available outside the Mississippi River Alluvial Valley. Clearly, the large marine conch shells were transported great distances to reach the Lower Valley. Even so, the frequency of imported raw materials found in scattered early Marksville contexts is considerably less than that evident during Poverty Point times.

Marksville sites generally were located on high ground adjacent to rivers or along floodplain lakes. Settlements were located along natural levees of rivers and distributary channels in the Mississippi Valley. Although sites are located along the system of slow moving secondary streams, settlement no longer was confined mainly to slack water environments. In fact, many early Marksville sites correlate quite well with the then active channel of the Mississippi River (Toth 1977). Most Marksville sites are found within the Lower Mississippi Valley, along the Mississippi escarpment of Maçon Ridge (Neitzel and Perry 1978; Smith et al. 1983).

Multiple mound ceremonial complexes usually were situated at the confluence of trunk channels and major crevasse distributary streams. These strategic locations functioned as trade and communication centers providing ready access to a variety of environmental zones for exploitation of food resources. Satellite residential communities, often featuring a single mound, were situated along the natural levees between stream junctures. Houses were circular, fairly permanent, and possibly earth-covered. Small seasonal resource procurement sites were scattered around the satellite communities to enhance efficiency of obtaining food resources (Jeter et al. 1989). Relict crevasse splays probably formed favored locations for satellite communities.

The economic base of the culture probably was similar to the hunting, fishing, and gathering subsistence strategy used in earlier periods. Maize probably first was utilized regionally by Marksville peoples (Walthall 1980). Maize and previously domesticated plant varieties, particularly pioneer annuals and other tropical cultigens such as squash and gourd, supplemented intensive riverine subsistence pursuits (Struever and Vickery 1973).

Few Marksville sites are recorded within the coastal zone; most of these represent minor components within sites. For example, very few Marksville sites are known from around Lake Pontchartrain, possibly reflecting a relative abandonment of the area from Tchefuncte to Marksville times. Most of Lafourche and Plaquemine parishes do not contain Marksville sites, reflecting the recent development of these landforms. Excavations at coastal Marksville sites have been limited to a few mound sites such as Coquille (16JE37), Boudreaux (16JE53), Big Oak Island (16OR6), and Magnolia Mound (16SB49); data collected at these sites primarily reflect mortuary practices, rather than the daily life-ways of the Marksville culture (Jeter and Williams 1989).

Several Marksville phases have been identified tentatively in the coastal region. These phases are based on geographic location, and on differences in ceramic assemblages. However, considerably more data are necessary to define better the geographic extent and characteristics of these phases. Three tentative phases have been identified within southeastern Louisiana. The LaBranche phase, in the Pontchartrain Basin, is an early Marksville phase usually recognized as a minor component at earlier Tchefuncte sites. The Marksville components at Tchefuncte (16ST1), Big Oak Island (16OR6), and the Little Woods Middens (16OR1-5) are recognized as part of the LaBranche phase. The Magnolia phase is a late Marksville phase identified within the St. Bernard Deltaic complex, especially along Bayou La Loutre. These sites typically include Coles Creek and Plaquemine components. The Coquille phase, named after the Coquille Site (16JE37), tentatively has been

identified within the Barataria Basin south of New Orleans. The validity of this phase, however, has not yet been confirmed (Beavers 1977; Jeter and Williams 1989; Phillips 1970).

Troyville-Coles Creek Culture (A.D. 400 - 1100)

The Troyville culture first was identified by Ford (1951) as a late Marksville - early Coles Creek manifestation. The recognized period name for the Troyville culture is "Baytown" (Phillips 1970). Baytown represents a period defined by ceramics and temple mound construction (Gibson 1978, 1982). Troyville culture, named for the now largely destroyed Troyville mound group (16CT7) in Catahoula Parish, emerged around A.D. 400. Troyville marks the end of a general subsistence pattern that began in Archaic times; although various groups experienced periods of cultural florescence (Poverty Point, Marksville), these occurred within an Archaic economic milieu (Gibson 1978). Two technological advances associated with the early part of the Baytown period radically altered prehistoric lifeways: maize agriculture and the bow and arrow (Smith et al. 1983). Furthermore, the appearance of temple mounds and large ceremonial structures reflect the emergence of a priestly social class; such a class could not have existed without a stable economic base (Smith et al. 1983).

Although sometimes viewed as two distinct periods, Baytown and Coles Creek have similarities and interconnections that warrant their study as a single unit of Louisiana prehistory. For the purposes of creating a cultural chronology, it is unprofitable to attempt to separate Troyville from Coles Creek culture. "Indeed, one gets the impression that the distinctions between the two are insignificant, and that the dividing line between them quite arbitrary" (Belmont 1967:27).

During the Baytown-Coles Creek period, the Native American population increased throughout coastal Louisiana. This increase is reflected in both the size and the number of sites in the area. Wetland niches exploited during earlier Tchefuncte times were re-inhabited during Troyville-Coles Creek times; however, subsistence pursuits differed (Gibson 1978). Smaller mammals and larger aquatic reptiles and fish were exploited during the later period. It has been suggested that the bow and arrow led to a higher hunter success ratio during Troyville-Coles Creek times (Gibson 1978). Fresh, brackish, and salt water environments were inhabited. Mussels, particularly *Rangia* sp, supplemented horticulture and hunting pursuits. Intensive exploitation of plants, and slash-and-burn horticulture, contributed to sedentism and community autonomy (Gibson 1978). Subsistence was varied and adaptable to different locations during this time. Settlement patterns in the coastal estuarine areas remained similar to those utilized by the preceding Late Archaic through Marksville cultures; the primary differences were expressed in the ceramic assemblages (Jeter and Williams 1989). Coles Creek sites primarily were situated along stream systems where soil composition and fertility were favorable for agriculture. Natural levees, particularly those situated along old cutoffs and inactive channels, appear to have been the most desirable locations (Neuman 1984).

While there were regional differences between Troyville-Coles Creek subsistence and settlement patterns, certain ceramic styles were widespread. Extensive interaction with other groups living along the coast, particularly with Weeden Island cultures in Florida, are apparent (Brown 1984). Coles Creek Incised ceramics are typical of this culture. They are characterized by a series of incised lines placed below the rim of the vessel, and by a series of triangles impressed beneath the incised lines. Other ceramic types include Beldeau Incised, French Fork Incised, Mazique Incised, and Pontchartrain Check Stamped. Pottery styles show popularity differences; Pontchartrain Check Stamped proliferated in the coastal region (Gibson 1978). The number and variety of ceramics reflect an increase in the size and complexity of the culture.

Coles Creek culture is characterized by the construction of large, flat-topped pyramidal mounds. Most large Coles Creek sites contain one or more mounds. The Coles Creek mounds typically are larger, and exhibit more building episodes than earlier Marksville burial mounds. Burials occasionally are recovered from Coles Creek mounds; however, their primary function appears to have been ceremonial. Structures built atop the mounds typically were constructed

of wattle and daub. At some Coles Creek sites, mounds are connected by low, narrow causeways; sometimes, multiple mound sites are associated with plazas. The complexity of Coles Creek mound systems suggests a more complex social structure; a centralized authority and a sizable labor force must have existed to build, maintain, and utilize these mounds. The centralized authority probably consisted of a special religious class; the general population occupied the region surrounding the large ceremonial centers (Smith et al. 1983; Neuman 1984).

Village areas, located away from the ceremonial centers, consisted of circular houses. Gibson (1978) postulates that Coles Creek sites having horticultural subsistence bases required compensatory adjustments in man-land relationships and in social and political institutions. It has also been postulated that during Coles Creek times, status probably was conferred by differential access to prime agricultural lands. Small Coles Creek sites consist mostly of hamlets and shell middens, which normally do not contain mounds. Coles Creek shell middens commonly occur in the coastal region on higher portions of natural levees (Springer 1974).

Recognized phases in southeastern Louisiana include the Baytown period Whitehall phase, the early Coles Creek Bayou Cutler phase, and the late Coles Creek Bayou Ramos phase. South-central Louisiana phases include the early to middle Coles Creek White Lake phase and the late Coles Creek Morgan phase. Roanoke is the recognized Troyville phase in southwestern Louisiana. The Welsh phase corresponds temporally to Bayou Cutler, and the Jeff Davis phase dates from the late Coles Creek period.

The end date of Troyville-Coles Creek was ca. A.D. 1100; however, like most other dates, this does not imply a sudden termination of that cultural period. No sharp division occurred between Troyville-Coles Creek and the cultures that succeeded it. Phillips' (1970) discussions on the complexities of Baytown ceramics, which are found to span Marksville, Coles Creek, and later cultures, aptly demonstrate this point.

Plaquemine Culture (A.D. 1100 - 1700)

In the Lower Mississippi River Valley, the indigenous Plaquemine culture emerged from Coles Creek by A.D. 1100. Plaquemine culture continued the same lifestyles as the previous Coles Creek cultures, with the exception that the importance and reliance upon agriculture seem to have increased. Ceramics were tempered with a variety of materials, including shell. Brushing became the most common decorative technique; however, earlier decoration techniques persisted. Engraving became popular later during this period (Smith et al. 1983). Plaquemine Brushed, Harrison Bayou Incised, Hardy Incised, L'Eau Noire Incised, Manchac Incised, Mazique Incised, Leland Incised, and Evansville Punctate are common ceramic types of the Plaquemine culture. Rectangular house structures were constructed of wattle and daub. Site locations favored the levees and margins of the alluvial valleys. Settlement patterns reflected dispersed villages or hamlets surrounding ceremonial centers. These settlement patterns remained basically unchanged from earlier Troyville-Coles Creek times (Smith et al. 1983). Salt mining at Avery Island became an important part of the Plaquemine culture. The importance of salt in the trade and subsistence networks of Plaquemine culture continued into the historic period.

Plaquemine culture represents an indigenous development that emerged from Coles Creek. Plaquemine peoples continued the settlement patterns, economic organization, and religious practices established during the Coles Creek period; however, agriculture, sociopolitical structure, and religious ceremonialism intensified. Plaquemine culture sites are characterized by ceremonial centers with multiple mounds surrounding a central plaza, and by the occupation of dispersed villages and hamlets (Smith et al. 1983).

Plaquemine culture derives its name from the city of Plaquemine, Louisiana, situated near the type site, Medora (16WBR1), which was excavated by Quimby (1951). This site is a ceremonial center located on the Mississippi River floodplain at Manchac Point, south of Baton Rouge. Two mounds at the site were excavated and recorded. Mound A was constructed in four stages. The pre-mound stage represented the original living surface and associated features. The features included two circular house or temple rings measuring 13.7 m (45 ft) and 7.6 m (25 ft) in diameter, several pits, and hundreds

of postmolds. The second stage of Mound A construction was an ovoid mound 30 m (100 ft) in diameter and 0.3 to 0.6 m (1 to 2 ft) high; this mound contained shallow pits, and many postmolds, some of which formed the square corner of a structure. The third stage of Mound A construction involved the addition of two truncated pyramidal mounds upon the initial mound, with a structure at the summit of each. During the fourth and final stage of construction of Mound A, a 38.1 to 39. 6 m (125 to 130 ft) diameter and 3 m (10 ft) high truncated pyramidal mound was built over the earlier mound complexes.

Mound B was separated from Mound A by an approximately 122 m (400 ft) long plaza. It also was ovoid in shape and very similar to the initial mound associated with Mound A, and it covered one or two pre-mound constructions (Quimby 1951). Based on these excavations, Quimby developed a trait list to characterize Plaquemine culture. These traits included the construction of truncated, pyramidal (platform) mounds in association with an adjacent plaza; mounds built in stages; square or circular buildings (temples) associated with mounds; and, a distinctive pottery assemblage characterized by a comparatively high proportion of plain dishpan-shaped bowls, jars with brushed decoration, and plates with interior decoration (Quimby 1951:129).

Another Plaquemine culture ceremonial center reported by Quimby (1957), the Bayou Goula site (16IV11), is situated on the west bank of the Mississippi River, near Bayou Goula, Louisiana. This site, excavated in 1941, consisted of two platform mounds dating from the Coles Creek to Plaquemine stage, and an historic contact component. The mounds had been constructed in stages; the larger mound, Mound 1, had been constructed in three stages. These mounds probably were constructed during prehistoric times, and may not have been used during the early contact period. Aboriginal occupation continued into the early historic period. While the documents are inconclusive, the initial French contact with the aboriginal village at 16IV11 occurred either during Iberville's 1699 exploration of the Mississippi River, or at the time of the 1718 Paris concession (Quimby 1957; Giardino 1984).

Woodiel (1980a, 1980b) described the 1977-1978 excavations at the St. Gabriel site (16IV128) on the Mississippi River natural levee northeast of St. Gabriel, Louisiana, as revealing a Plaquemine culture ceremonial center. At the time of its excavation, the site included one earthen mound and a largely destroyed adjacent village site. The excavated mound was similar to those identified previously at the Medora site and at Bayou Goula. It also was built in stages, and in association with buildings (temples). Woodiel noted two settlement patterns. The St. Gabriel site was located on the backslope of the natural levee of the Mississippi River, between the natural levee crest and the backswamps, and adjacent to a probable prehistoric crevasse (water source). This placed the site near two distinct ecozones, the natural levee and the backswamp, allowing the inhabitants to exploit a wider variety of faunal and floral resources than would be available in a single ecozone. These food resources included large and small mammals, birds, turtles, fish, persimmon, honey locust seeds, and at least some corn. Woodiel noted that other prehistoric sites along the Mississippi River were situated in the vicinity of the cut bank of a meander loop (Woodiel 1980a, 1980b).

Mississippian Stage (A.D. 1000 - 1700)

Late during the prehistoric period, the indigenous Plaquemine culture was influenced by Mississippian culture. Mississippian influences radiated from the middle Mississippi River Valley to southern Louisiana, into central North Carolina, and even north into the Great Lakes region (Haag 1971). The Mississippian Stage represents a cultural climax both in population growth and in social and political organization for those cultures occupying the southeastern United States (Dye and Cox 1990; Phillips 1970; Williams and Brain 1983). As defined traditionally in the literature, the advent of the Mississippian stage is manifested at sites in the Lower Mississippi Valley and along the northern Gulf Coast through incorporation of traits such as shell tempered ceramics, triangular arrow points, and copper-sheathed wooden earspools (Williams and Brain 1983). This stage in southern Louisiana has been discussed and

defined in a variety of formats by scholars in recent decades. The available archeological data suggest that the cultural traditions prevalent in southern Louisiana were local in flavor; this indigenous culture is referred to as Plaquemine. Most scholars now agree that the Plaquemine culture emerged from the preceding Coles Creek culture in the Lower Mississippi Valley by A.D. 1100, and that it later was influenced by Mississippian peoples from the north (Kidder 1995; Neuman 1984; Weinstein and Kelley 1992). However, there is no universal consensus about the precise origins of Plaquemine culture, and some writers still distinguish Mississippian and Plaquemine, which is why they are presented separately here.

Mississippian sites in Louisiana typically are located along the extreme southeastern coast, and in an isolated pocket in the northeastern part of the state. Mississippian culture continued to influence lifeways of southern Louisiana until contact with historic European cultures. Mississippian culture is characterized by the emergence of hierarchically ranked societies, nucleated villages organized around large mound centers, intensive agriculture based on three principal crops (corn, beans, and squash), broad interregional trade networks, and a wide range of artifacts showing a diversity in form and function.

Mississippian subsistence was based on the cultivation of maize, beans, squash and pumpkins; the collection of local plants, nuts, and seeds; and, the exploitation of various riverine and terrestrial species. Major Mississippian sites were located on fertile bottomlands of major river valleys; sandy and light loam soils usually composed these bottomlands. A typical Mississippian settlement consisted of an orderly arrangement of village houses surrounding a truncated pyramidal mound. These mounds probably served as platforms for temples or as homes for the elite. A highly organized and complex social system undoubtedly existed to sustain these intricate communities. Mississippian sites containing large "temple mounds" and plazas have been recorded throughout the Southeast at such places as Winterville, Transylvania, Natchez, Moundville, Bottle Creek, and Etowah (Hudson 1978; Knight 1984; Walthall 1980; Williams and Brain 1983).

Mississippian ceramics were characterized by shell tempering, an innovation that enabled potters to create larger vessels (Smith et al. 1983:203). Mississippian peoples used ceramic vessels such as globular jars, plates, and bottles, as well as loop- and strap-handled pots. Decorative techniques included engraving, negative painting, and incising; modeled animal heads and anthropomorphic images also adorned ceramic vessels. Other Mississippian artifacts included chipped and ground stone tools; shell items such as hairpins, beads, and gorgets; and mica and copper items. Late during the prehistoric era, the indigenous Plaquemine culture came under the influence of Mississippian culture from the middle Mississippi River Valley. Mississippian culture extended its influence from the upper portions of the lower Mississippi Valley, across northern Mississippi and western Tennessee, into central North Carolina and north into the Great Lakes region (Haag 1971). Mississippian culture continued to influence, although to a smaller extent, the lifeways of inhabitants of Louisiana right up to historic contact.

Protohistoric and Historic Period

Understanding of protohistoric and historic Native American cultures of the southeastern United States is limited severely by a frequent inability to recognize the ancestral cultures from which these groups were derived. This is due in part to the waning influence of Mississippian Culture, and as a result of the social disruption initiated by European exploration and colonization throughout the Southeast. Convention holds that as the influence of Mississippian Culture declined throughout the Southeast, populations along the northern Gulf Coast reverted to an egalitarian state and readopted the hunting and gathering subsistence strategies that had been successful throughout the Archaic and Woodland stages (Peebles and Kus 1977; Peebles and Mann 1983). These strategies frequently were augmented either by itinerant horticulture or small-scale agriculture.

Villages apparently remained similar to those observed previously at Plaquemine and Mississippian period sites. The larger villages generally featured one or more truncated pyramidal mounds surmounted by chiefs' houses and temples; the remaining villagers lived in the area surrounding the mounds and in satellite hamlets. Houses typically were rectangular in

plan and they were constructed of poles placed in the ground, with wattle and daub walls, and thatched roofs (Swanton 1946). Cummins (1990), who described the villages of the Chitimacha peoples living near Bayou St. John at the time of French contact, stated that "Their villages are composed of wooden houses and they used complex water craft." The French learned cultivation techniques for corn, squash, potatoes, tobacco, and other indigenous crops from the Chitimacha and apparently lived in their communities during times of famine.

When the Europeans arrived in the Southeast, social interactions between these groups brought about major social/demographic reorganization. Native American population upheavals and depletions were related to warfare, disruptive migrations, and epidemics introduced by European contact (Smith 1987). Information about protohistoric and historic populations, gleaned only in part from the archeological record, relies predominately on early European chroniclers. Although Hernando de Soto's expedition passed through parts of Louisiana in the 1540s, it wasn't until the French entered the region in 1682 that the first information was recorded concerning Louisiana's aboriginal population. At that time, five Native American linguistic groups occupied southern Louisiana: Natchezan, Muskhogean, Tunican, Chitimachan, and Atakapan.

Natchezan Indians living in southern Louisiana included the Tensa and the Avoyel. The Tensas moved downriver from present-day Tensas Parish in 1706; they eventually settled around Mobile, Alabama and were assimilated by other Indian groups in the area. The Avoyel resided along the Red River near Alexandria and Marksville; by 1805, they no longer existed as a group.

Muskhogeans comprised the greatest number of Indian groups, including the Houma, the Acolapissa, the Bayougoula, the Tangipahoa, the Okalousa, the Washa, and the Chawasha. The most prominent of these, the Houma, moved from west Mississippi to the vicinity of Angola, Louisiana. Their neighbors, the Tunica, drove them from that region; a series of migrations brought them to the marshes of Terrebonne Parish, where their descendants reside today. The Acolapissa once lived near the mouth of the Pearl River; they subsequently merged with the Houma and lost their tribal identity. The Bayougoula lived on the west bank of the Mississippi River south of Plaquemine in Iberville Parish. The Tangipahoa lived in southeastern Louisiana. The Okalousa lived in the upper Atchafalaya Basin. The Chawasha and Washa lived along Bayou Lafourche. All Muskhogean-speakers engaged in hunting, fishing, gathering, and agriculture for subsistence. In 1706, the Tunica moved south from northwestern Mississippi and settled near the confluence of the Mississippi and Red Rivers. By 1800, they migrated to the Avoyelles Prairie around Marksville (Smith et al. 1983).

The Chitimacha controlled much of the upper Barataria Basin along both Bayou Lafourche and the Mississippi River. They were able to survive into the twentieth century largely because of their inaccessible location; the eastern Chitimacha were recorded in the area between the Atchafalaya and the Mississippi rivers as early as 1702. At that time, they inhabited present-day Iberville, Assumption, St. James, Lafourche, St. Martin, and Terrebonne Parishes (Giardino 1984; Swanton 1946). Today, the Chitimacha reside along Bayou Teche near Charenton, Louisiana.

In 1700, Atakapan-speakers consisted of approximately 3,450 Atakapas and Opelousa. During the Historic Contact period, the Atakapas continued to rely heavily on hunting, fishing, and gathering for subsistence. The Atakapas lived along three rivers in the southwestern part of the state: the Vermilion, the Calcasieu, and the Mermenteau. The lesser-known Opelousa lived near present-day Opelousas, in St. Landry Parish, Louisiana (Smith et al. 1983). Like most other Indian groups of Louisiana, these groups declined drastically during the late eighteenth and early nineteenth centuries, due to epidemic diseases and hostilities (Aten 1984).

Conclusions

Any prehistoric sites within the proposed Carrollton Revetment project area are unlikely to contain intact cultural materials dating from the Paleo-Indian or Archaic Stages, because the Mississippi River channel has changed course so many times throughout the Holocene Period. Instead, the remains of these cultures are found within the geologically stable west and central

portions of the state. Within the northwestern portion of the state, Paleo-Indian and Early Archaic sites occur primarily along undisturbed Pleistocene ridge tops. In the southeastern portion of the state, they are found along relatively flat or undulating bluff tops overlooking floodplains and on geologically unaltered prairie terraces.

The first groups found along the rivers and levees of the project area are those associated with the Poverty Point Culture. Settlements dating from the Poverty Point to the Contact Period were located along lake margins, especially at intersections with bayous or rivers; major natural river levees; active or relict river channels; or coastal marshes. Throughout much of the prehistory of Louisiana, a settlement and subsistence pattern of seasonal fission and fusion was maintained to efficiently exploit locally available natural resources. It was not until the latest stages of prehistory that maize-based agriculture had a measurable impact on Native American settlement and subsistence practices. In addition, many of the adaptive strategies employed by prehistoric Native Americans still were entrenched firmly in cultural adaptations during the protohistoric period.

CHAPTER IV

HISTORIC OVERVIEW

Introduction

The Area of Potential Effect associated with the Carrollton Revetment Project lies along the inside of a curve in the Mississippi River known locally as the Greenville (Greeneville) Bend. The terrestrial portion of the proposed project reach includes a stretch of the riverbank measuring approximately 768.5 m (2,521.3 ft) in length; this area ranges in width from 10 to 37 m (32.8 to 121.4 ft). The Area of Potential Effect also includes an underwater component, which is located adjacent to the riverbank, and which measures 128 m (420 ft) at its narrowest point, by 155 m (508.5 ft) at its widest point. A total of 19 wrecked vessels have been located previously in the underwater portion of the project area by the U.S. Army Corps of Engineers, New Orleans District. Currently, the Bisso Marine Company, E. N. Bisso and Son, and the Bisso Towboat Company conduct salvage, towing, commercial diving, and derrick operations from their facilities along the riverbank in the proposed project area. The Bisso family has engaged in similar commercial activity at this location since at least 1891. Between ca. 1893 and 1958, the project area contained a wharf and ferry landing. In addition, the downriver terrestrial portion of the project area is located on property now owned by the Audubon Institute; it is utilized as part of the public park facilities of Audubon Park known as the "Butterfly."

Several factors have influenced the historical development of both the terrestrial and the maritime portions of the Area of Potential Effect. The underwater portion of the project reach was impacted directly by the commercial growth of the Port of New Orleans, by increasing maritime traffic, and by the evolution of riverine businesses conducted at the edge of the Mississippi River. In addition, in the colonial and early American eras, a large indigo and sugar plantation encompassed the terrestrial portion of the proposed project area. Following the Louisiana Purchase, the Area of Potential Effect was a part of the Greenville neighborhood, an area that experienced growth because of its location between New Orleans and the town of Carrollton. Finally, the development of Audubon Park in the 1890s and early twentieth century has contributed to the settlement, development, and continued use of the terrestrial portion of the Area of Potential Effect.

The historical trends affecting the proposed project reach form the underpinnings of this chapter. The early colonial period was dominated by the plantation system, as fertile soils of the Mississippi riverbank supported the agricultural production of indigo, sugar cane, and rice. Sugar remained a dominant crop in the region through the nineteenth century, and the Port of New Orleans became the busiest import/export locus in the nation. The project reach witnessed the encroachment of suburban development beginning in 1833, when the town of Carrollton was created immediately adjacent to the Carrollton Revetment Project area. Just three years later, in response to the growth of the Carrollton area, the *faubourg* of Greenville was formed, including the majority of the current project reach. The emergence of the historic New Orleans and Carrollton railroad during this period also spurred the development of the area, and in 1870, Greenville was annexed to the City of New Orleans, as was Carrollton in 1874. Beginning in the late nineteenth century, riverfront commercial and residential structures in this area

were displaced by levee and revetment construction, the building of the Orleans Public Belt Railroad line, and by modern development, including the U.S. Army Corps of Engineers, New Orleans District reservation, and the Bisso riverside complex mentioned above. This chapter provides a general historic context pertaining to the Greenville and Carrollton neighborhoods, specific discussions of historical topics that impacted the current project reach, a maritime history of the river economy, and a discussion of the potential for archeological resources within the Area of Potential Effect.

The History of the Carrollton Bend/ Greenville Area

During the early eighteenth century, France supported several attempts to colonize the Province of Louisiana. In 1712, Sieur Crozat was authorized to establish trade within the colony. After his efforts failed and Crozat relinquished his patent in 1717, the King of France provided John Law and his Mississippi Company (later known as the Company of the West, and finally, the Company of the Indies) exclusive trading rights in the area. Law's company also was authorized to grant land within the Province of Louisiana in order to promote settlement and agriculture (Ledet 1938:221-222, Swanson 1975:67).

Mindful of the failure of Crozat, Law turned to the brothers Pierre Le Moyne, Sieur d'Iberville and Jean Baptiste le Moyne, Sieur de Bienville for assistance in the settlement plan. In 1718, Bienville chose a location between the Mississippi River and Lake Pontchartrain as the setting for his new colony. Because it was surrounded by water, Bienville dubbed the new town "L'Isle de la Nouvelle Orléans," or the Island of New Orleans (Kelman 2003:4). Bienville believed that the placement of the new colony would "offer a commercial metropolis unparalleled access to the continent's interior as well as to markets throughout the Atlantic World of trade" (Kelman 2003:6).

On March 27, 1719, soon after he founded the city of New Orleans, Bienville obtained a concession for a large tract of land that included present-day Carrollton and all of the proposed project reach (Mahé 1976:11). The Bienville holdings stretched three marine leagues (approximately 14.5 km [9 mi]) up the river, encompassing the area between present-day Bienville Street in the Vieux Carré to roughly the present boundary between Orleans and Jefferson Parishes at Monticello Avenue. Extending 40 arpents (1.5 mi) into the interior from the left descending bank of the Mississippi River, the grant comprised almost half of the present Crescent City (Mahé 1976:11; Swanson 1975:66-67).

Bienville developed only the portion of his property located adjacent to the fledgling settlement of New Orleans; he did not cultivate the upriver portion. Furthermore, he retained ownership of his vast concession for only six years. In 1725, the French government removed him from the governorship of Louisiana and soon thereafter deprived him of his grant of land. While he eventually regained the post of colonial governor in 1732, he never recovered his lost property (Davis 1971:52-59, 63-66; Mahé 1976:12).

Although the Bienville grant was extinguished in 1728 through the Edict of the Council of State at Versailles, the vast tract in the Greenville/Carrollton area remained largely intact for more than a century (Mahé 1976:12). The founder of New Orleans unsuccessfully attempted to regain control of the property until 1737. Beginning in the late 1720s, the Bienville tract passed in succession first to Nicolas Chauvin de La Frênière, then to his heirs, and finally to his son-in-law, Louis Césaire LeBreton. LeBreton enlarged his holdings by acquiring 12 additional arpents (approximately 702 m [2,304 ft]) of frontage along the riverfront in 1751, and 15 arpents (878 m [2,880 ft]) in 1758. The governors of the French colony confirmed these acquisitions in 1757 and 1764, respectively (Bezou 1973:32, 34-36, 71).

After LeBreton died, Barthelemy Daniel Macarty bought an enormous tract from the LeBreton succession in 1781 including 32 arpents (1,873 m [6,144 ft]) along the Carrollton Bend of the Mississippi River, where he established a sugar plantation (Ledet 1938:227). The purchase extended back from the river 40 arpents (2,341 m [7,680 ft]) (Bezou 1973:71; Mahé 1976:12). This area became the *faubourg* of Carrollton. Barthelemy Macarty bequeathed the estate to his eldest son, Jean-Baptiste Macarty, who died on November 10, 1808. The will of Jean-Baptiste Macarty divided the property among his three

children. Apparently, the children were uninterested in owning and managing a sugar plantation, and by 1831, they sold their interest in the estate to John Slidell, Laurent Millaudon, Samuel Kohn, and the New Orleans Canal and Banking Company. In 1833, the developers and the banking company hired a surveyor, Charles F. Zimpel, to help divide the former plantation into lots and squares. They then offered it for sale as the village of Carrollton (Bezou 1973:70-73; Mahé 1976:10-12). The development of this town spurred both commercial and residential settlement along the riverfront, and, thus, had a major effect on the Carrollton Revetment project reach.

Later in the eighteenth century, the vicinity of the proposed project reach came under the ownership of another notable New Orleanian, Jean Étienne de Boré, the first Mayor of New Orleans from 1803 to 1804. By exchanging acreage he owned in St. Charles Parish in 1781, de Boré obtained 20 arpents (1.1 km or 0.7 mi) along the Mississippi from Cecelia Levasseur, widow of Juan Piseros (Figure 11). The de Boré plantation, located in the vicinity of what is now Audubon Park, is regarded widely as the birthplace of the sugar cane industry. In 1795, Antoine Morìn, a Haitian sugar maker in the employ of de Boré, successfully granulated a large quantity of sugar on the riverside plantation. General Victor Collot, a Frenchman out of favor with the French revolutionists, visited the de Boré plantation in 1796 and reported that de Boré held 40 slaves. Using materials (bricks, tiles, lime, carpenter's wood) prepared on the plantation, the slaves had built a sugar mill, grinding shed, and drying room of brick covered with tiles. The now-destroyed area of the structures included cylinders and kettles, and it lay close to the Mississippi River (Wilson 1980:72).

Other contemporary observers commented on the de Boré plantation. James Pitot reported that de Boré "planted 100 arpents [approximately 34 ha or 84 ac] of cane to be harvested into sugar in 1796, paid a high price to be certain of having a sugar maker, built the grinding shed, sugar mill, drying house and sheds, and to the astonishment of the entire province made with about thirty [slaves], 100,000 pounds of raw sugar" (Pitot 1979:73). Pierre Clément de Laussat, the French official who supervised the transfer of the Louisiana Purchase from France to the United States, described a visit to the de Boré plantation very early in the nineteenth century. He paid elaborate compliments to the de Boré residence, gardens, lanes of orange trees, and sugar cane fields, from which the planter in 1803 harvested approximately 36,288 kg (80,000 lbs) of sugar (Bush 1978:23-51). The first governor of the American territory of Orleans, William C. C. Claiborne, mentioned in a letter to President Thomas Jefferson that de Boré "has evinced much taste in the arrangement of his gardens and yards" (Wilson 1980:72). The noted New Orleans historian Charles Étienne Arthur Gayarré, grandson of de Boré, also has left a description of the house and grounds owned by his maternal grandfather. Like other accounts, Gayarré noted particularly that the residence and the complex of buildings lay close to the river (Wilson 1980:74-75).

When de Boré died in 1820, an extensive inventory of his plantation described not only the plantation residence but also the following structures: two pigeon cotes, probably flanking the main house; a billiard hall measuring approximately 5.5 x 7.6 m (18 x 25 ft) in size; a milk house; a distillery; a shed for farm animals; a corn mill; a kitchen in the work area; 18 slave cabins; a forge; a warehouse that also served as coach house and stable; an abandoned rum distillery; a slave hospital; two cabins for house servants; five chicken houses; a sugarhouse and mill; and the purgery where slaves transferred the raw sugar into hogsheads and then drained off the molasses (Probate Inventories 1820:199). Although the inventory does not give the exact location of each structure described, the document indicates that the buildings in question were clustered in an area close to the river.

De Boré was survived by four daughters; however, the plantation passed to Jean Baptiste LeBreton, his grandson, in 1824. Jean Baptiste was the child of the eldest de Boré daughter, Jeanne Marguerite Marie Isabelle. Jean Baptiste then sold the upper 2 arpents (117 m [384 ft]) of the plantation (i.e., the tract that is most upriver) to his uncle, the elder Charles Gayarré, who in turn sold the two arpents in 1825 to another de Boré son-in-law, Pierre Foucher (Conrad 1988:1:90; Zimmerman 1980:57-60). Foucher already owned the plantation immediately adja-

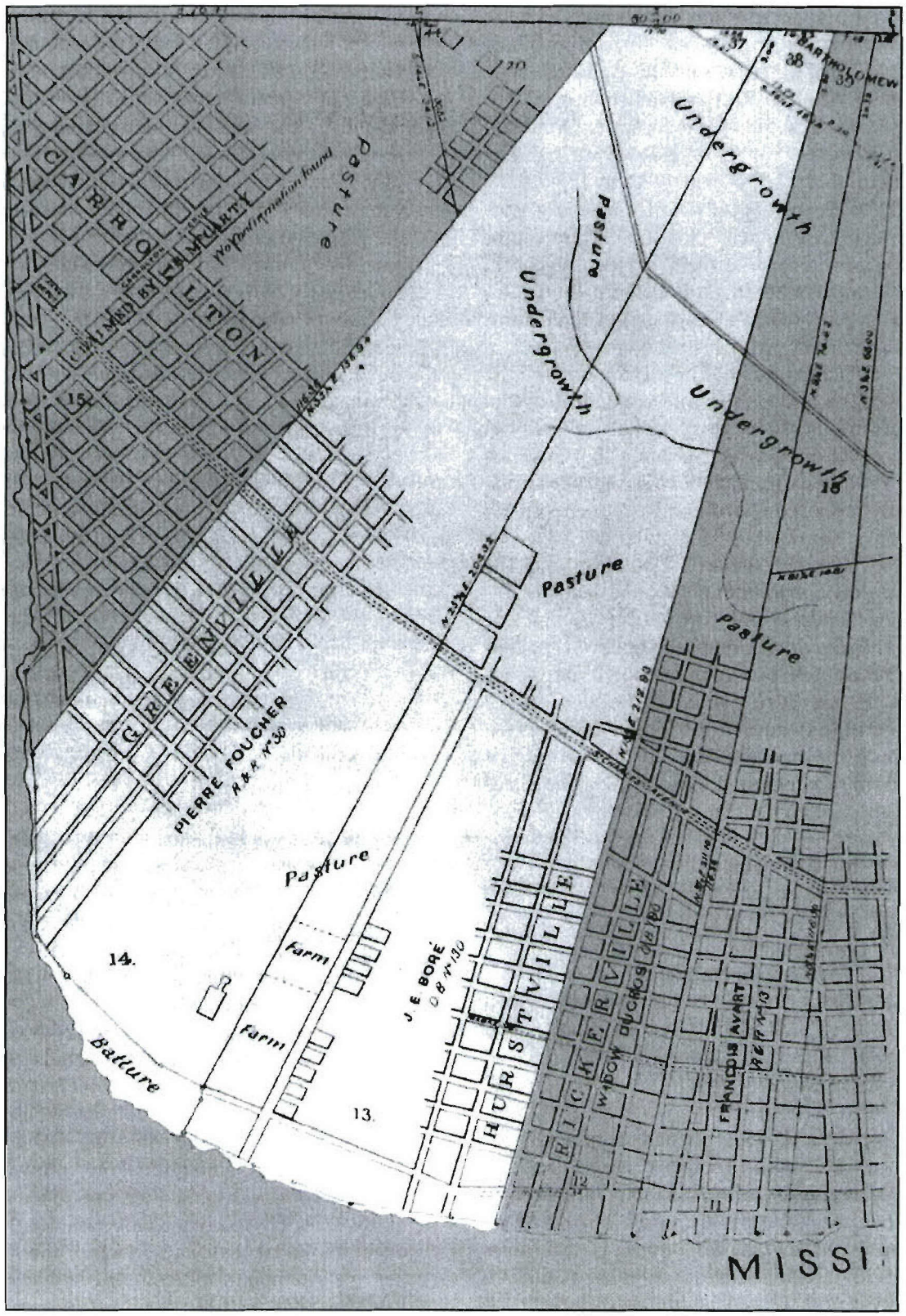


Figure 11. **This surveyor's map show's Greenville located between the city of Carrollton and the undeveloped Foucher plantation that soon became Audubon Park (Surveyor General's Office, January 26, 1872, excerpted from Cangelosi and Schlesinger 1997).**

cent to the upriver portion of this tract (Figure 12). The Foucher properties, consisting of 2 arpents (117 m [384 ft]) from the de Boré estate combined with the 10.5 arpents (615 m [2,016 ft]) previously held, today comprise Audubon Park (Conrad 1980:90; Wilson 1980:75). The portion of this 12.5 arpent (732 m [2,400 ft]) tract that was located closest to *faubourg* Carrollton comprises Area A of the currently proposed Carrollton Revetment project reach. In addition to these holdings, Foucher owned 7 additional arpents (410 m [1,344 ft]) of river frontage, just upriver from his 12.5 arpent (732 m [2,400 ft]) plantation holdings. He purchased the land in 1800, at a public sale conducted by the creditors of the succession of Bartholomé LeBreton. This tract, which became the *faubourg* (suburb) Greenville, includes the balance of the currently proposed Carrollton Revetment project reach.

Between the Macarty Plantation and the original de Boré Plantation lay the lands of Pierre Foucher, son-in-law of Jean Étienne de Boré. The *faubourg* Greenville once was part of his large plantation, which, as noted above, included the de Boré plantation. After Foucher purchased the swathe of land in 1800, he apparently built his first residence in the vicinity of the current project reach. As noted by one historian of the Greenville/Carrollton area in 1876:

> On the upper part of this plantation and near the river, stood till within a few years, perhaps the first and oldest building ever put up in this whole neighborhood of plantations. This was the dwelling known as the William Young house, which was burned down a few years ago. It was a structure of ancient style and time-worn complexion, and ...before Greenville was planned, had been the plantation residence of Pierre Foucher (Williams, quoted in Wilson 1997:33)

Sometime after 1825, Foucher abandoned this residence. He built another, more elaborate house downriver where Audubon Park now is located. It is likely that the structures noted on the map drawn by Charles Zimpel in 1834 map (Figure 12) are the original Foucher residence and his second, more elaborate dwelling; they were positioned upriver and downriver, respectively.

After Foucher abandoned the upriver residence, which almost certainly was located in the vicinity of the intersection of Audubon and Chestnut Streets (an area that now is encompassed by the land-side batture and Public Belt Railroad tracks), the building was converted to a school. L. F. J. Lefort opened the school in November of 1816, advertising the academy "for the reception of young gentlemen...at his former residence on Mr. P. Foucher's estate" (from the *Louisiana Courier*, October 14, 1816, quoted in Wilson 1997:33). Charles Gayarré, grandson of Jean Étienne de Boré, nephew of Pierre Foucher, and a noted Louisiana historian, was one of the pupils at this school. He recalled the school and its master:

> On the Foucher plantation, and near its upper limit, there was a very large house, occupied by one Lefort, who kept a school that was very well attended by the children of planters on both sides of the river. It was there that I learned my ABC....This Lefort was a man of culture, but rather rough, and unmercifully addicted to striking his pupils. I was six years old when I attended his school, and I have not yet forgotten, after so many years, the blows which he used to give me because my young and imperfect organs of speech could not properly pronounce the English [word] the. He was very fat and pot-bellied (quoted in Wilson 1997:33).

The only other notable feature located on this section of the Foucher tract at this time was a racetrack. Located immediately behind the school, it was called the "Belle Point Race Course," and it is the most prominent feature of the Greenville section depicted on the 1834 Zimpel map (Figure 12).

Pierre Foucher died in 1832, leaving his estate to his two children, Louis Frederic Foucher and Marie Antonine Foucher; the latter married Philippe Auguste Delachaise. The estate was partitioned between the two siblings, with Louis Foucher retaining the large uptown plantation. Although the plantation contained over 95 ha (600 ac) of land, very little was developed or even arable. At that time, much of the land that became Audubon Park, situated between the de Boré tract and the LeBreton tract (which became Greenville), was low-lying and flooded in the rainy season. Gayarré, who grew up at the plan-

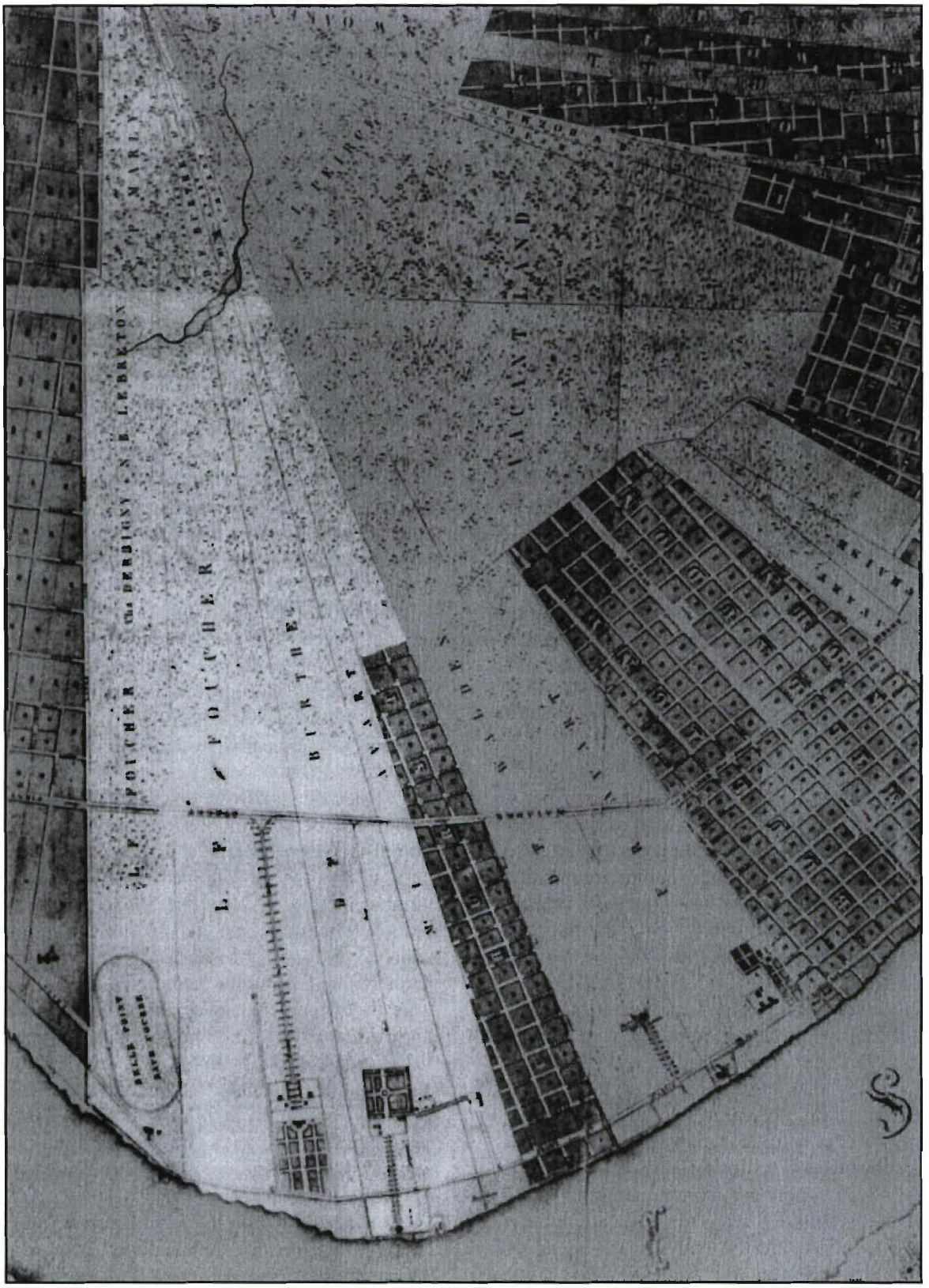


Figure 12. **This map, drawn by Carrollton surveyor Charles F. Zimpel in 1834, depicts the vicinity of the current project area. Note the race course and "old house" on the upriver Foucher tract, as well as the new Foucher plantation, in the area where Audubon Park now sits (excerpted from Cangelosi and Schlesinger 1997).**

tation of his grandfather, remembered, "there never was any agriculture of any consequence on this Foucher place" (quoted in Forman and Logsdon 1985:85).

Perhaps because of the lack of agricultural potential, the younger Foucher never developed the area. In fact, in 1836, shortly after settling his father's estate, Louis sold the LeBreton portion of the property to James Ogilvie. That same day, Ogilvie contracted with Oliver Aiken and John Green to develop the land into a subdivision named Greenville, named after the new developer. The new *faubourg* was bounded by the river, Third Street (later Elm, now Freret Street), Lowerline Street (the "lower line" of the Macarty Plantation, demarcating the downriver edge of Carrollton), and the original line of the 10.5 arpent (615 m [2,016 ft]) Foucher plantation, now the upriver boundary of Audubon Park (Figure 13) (Wilson 1997:33). The remainder of the plantation remained fallow until Foucher left the city sometime before the Civil War. He returned to France, where he adopted the title of the Marquis de Circé (Irvin 1997:39; Forman and Logsdon 1985:86).

The Development of the Carrollton and Greenville Faubourgs

In January 1832, Barthelemy, Edmond, and Marie Celeste, the last of the Macarty heirs, came of age and ratified the sale of the family plantation. Ownership of the property passed to three entrepreneurs and their banking company, who divided control as follows: the New Orleans Canal and Banking Company held 10/20th of the property; Samuel Kohn 5/20th; Laurent Millaudon 4/20th; and, John Slidell 1/20th. The new owners hired surveyor and engineer Charles F. Zimpel to draw a plan dividing the acreage into squares. Zimpel completed his plan, which created squares that measured 98 m (650 ft) in length and width. A total of two lots, each measuring 99 x 198 m (325 x 650 ft) in area, occupied each square (Perilloux 1945).

While Zimpel was constructing his plan, the entrepreneurs hired licensed auctioneer, Isaac S. McCoy, and on May 1, 1833 McCoy conducted a public auction at the New Exchange Coffee House in New Orleans in which lots in the village of Carrollton were sold. The sale proved to be a financial success for the developers, and resale of lots formed a brisk business (Perilloux 1945). By 1835, the town of Carrollton was experiencing rapid residential and commercial growth.

Some controversy exists regarding the origin of the name "Carrollton." In 1876, William H. Williams, a post Civil War surveyor and land developer, declared that the name Carrollton derived from General William Carroll, who commanded the Kentucky troops at the Battle of New Orleans and who supposedly camped on the Macarty Plantation in 1814 (Bezou 1973:71-72). Carroll subsequently became Governor of Tennessee and visited New Orleans in 1825, where he received a hero's welcome (Chase 1979:100). Despite this explanation, however, at least one historian has argued that the name of the village honored the only Catholic and last surviving signer of the Declaration of Independence from Maryland, Charles Carroll of Carrollton, (which is how he signed the famous document) (Perilloux 1945:4-6). The latter Carroll died in 1832, the year the Carrollton area was created. Because the earliest streets in the village honored American statesmen, this argument may have validity. Certainly Carroll's wealth, Catholicism, and extreme fiscal conservatism would have appealed to the entrepreneurs who created the village.

Regardless of the derivation of the town name, the neighborhood grew rapidly after the initial lots were offered for sale. Adding to that growth was the development of a street railway linking the city of New Orleans to the new suburb. No doubt orchestrated by the entrepreneurs who developed Carrollton, a group of railroad boosters held a public meeting in 1832 to advocate the construction of a railroad between New Orleans and the fledgling village. In February 1833, just a few months prior to the Carrollton auction, the Louisiana legislature chartered the New Orleans and Carrollton Railroad. The railroad began laying tracks in 1834, and began passenger service on September 26, 1835, (Mahé 1976:26-40). The New Orleans and Carrollton Railroad operated on 9.7 km (6 mi) of track extending from the central business district of New Orleans along Nayades (now St. Charles) Avenue to the village of Carrollton; by 1836, steam cars reaching speeds of four miles per hour ran along the tracks (Swanson 1975:98). The steam-

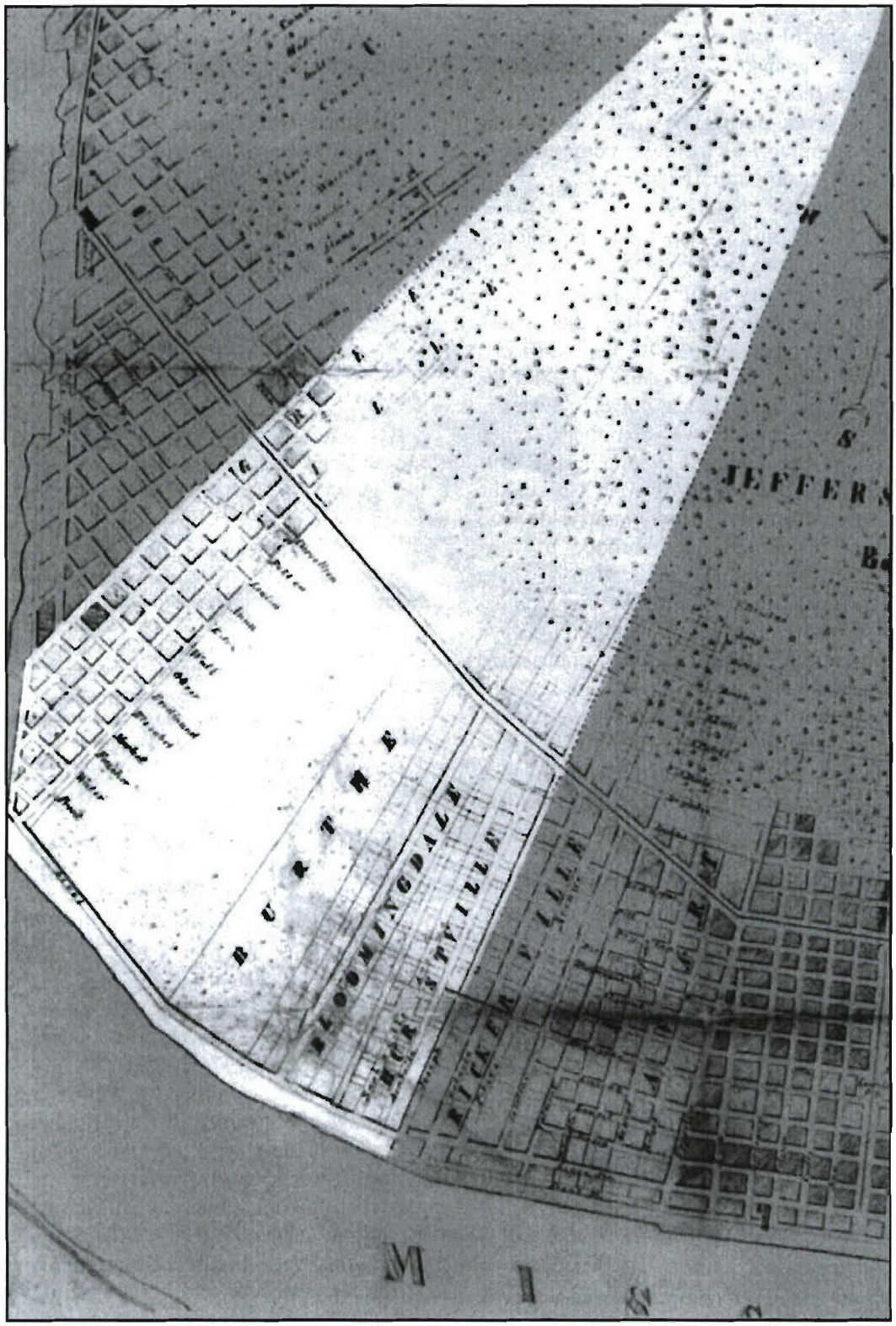


Figure 13. **The uptown *faubourgs* of Greenville, Butheville, Bloomingdale, and Hurstville can be seen on this 1885 map, drawn by W. Walker (excerpted from Cangelosi and Schlesinger 1997).**

powered streetcars commuted between New Orleans and Carrollton every two hours, seven days a week (Swanson 1975:105). The railroad provided transportation for excursions into the country; however, during the pre-Civil War era it remained impractical for daily commuting to the city from distant suburbs such as Greenville and Carrollton.

The railroad built its depot near the junction of Canal (Carrollton) and First (St. Charles). The notable Crescent City architects James Gallier, Jr. and John Turpin designed and built an elaborate Gothic revival addition to the depot in 1851. Cast iron was used in the construction, and the building contained a clock tower (Swanson 1975:105). The structure was demolished when the levee was expanded during the early 1890s (see below). In the words of John Chase, the railroad "transformed a rural countryside into the premier residential neighborhood of New Orleans" in a single generation (Chase 1979:121). The railroad improved communication and stimulated business interaction between Carrollton and New Orleans, which contributed to the growth of the village, and of the Greenville suburb (Ledet 1938:235).

The most telling gauge of the growth of the Greenville/Carrollton area was the rapid rate of commercial development in the region. As soon as the railroad was completed, the Carrollton Hotel and Gardens was erected. It proved a major stimulus to the economic growth of the village (Ledet 1938:238). The hotel was successful in luring large numbers of city dwellers to the village on excursions (Swanson 1975:105). While a fire destroyed the hotel in 1842, the structure was rebuilt almost immediately due to its profitability (Ledet 1938:239). According to one historian:

> [t]he Carrollton hotel, the first resort hostelry opened in Jefferson, attracted a large clientele transported by the trains while horse fanciers rode to the Eclipse Course after 1838. For a fare of 37½ cents, city dwellers could and did indulge in shooting galleries, regattas, dances, bowling greens, cricket clubs, tenpin alleys, and card games, all available in Carrollton (Bezou 1973:73)

The Eclipse Course was not the first racetrack in the area; as noted above, the Belle Point Race Course opened prior to 1834, when the Zimpel map was drawn. The Eclipse Course was located immediately adjacent to Greenville, between the Levee and Magazine Streets, and Lowerline and Adams Streets (Figure 14).

The Carrollton Hotel, which later became known as Carrollton Gardens, was in successful operation for many years. One New Orleans guide described a visit there subsequent to fire and reconstruction of the building. He wrote:

> The trip to Carrollton is deservedly one of the most popular excursions in the neighborhood of the city. Here are situated the Carrollton Gardens, which for many years have been a favorite resort with our people, and a place much admired by strangers . . . . The spacious walks are lined with the choicest flowers, whose bloom and fragrance are especially attractive to those who come from the North, where snow and ice greet the eye on every hand. Instead of snowballs, the visitor may obtain an exquisitely arranged bouquet or the rarest of plants, and in place of sleet and ice, he will see a verdure most pleasing to the senses. Connected with the gardens there is a spacious building with large, airy and comfortable rooms . . . kept as a private family hotel, on the European plan, with a restaurant, where the most inviting meals, with all the substantials and delicacies afforded by our markets may be obtained . . . (Waldo 1879:24).

A steamboat landing in the vicinity of the hotel provided a disembarkation point for hotel visitors. However, guests generally returned to the city by rail (Ledet 1938:239-240). Like the New Orleans and Carrollton Railroad Depot, the hotel survived until the early 1890s, when construction of a new levee required its demolition (Figure 15) (Mahé 1976:217).

A popular outing for New Orleanians was to take the steamer to Carrollton, spend a few hours at the Carrollton Gardens, and return to the Crescent City by rail. Beginning in 1845, a ferry also ran across the Mississippi from Carrollton; its landing was situated at the foot of Dublin Street (Figure 14). Originally just a skiff, the ferry was converted to steam-power in 1868. At that time, flatboats also landed at the lumber mills operating on the batture or behind the levee. On the eve of the Civil War, brigs, schooners, sloops, flatboats, and keelboats could be

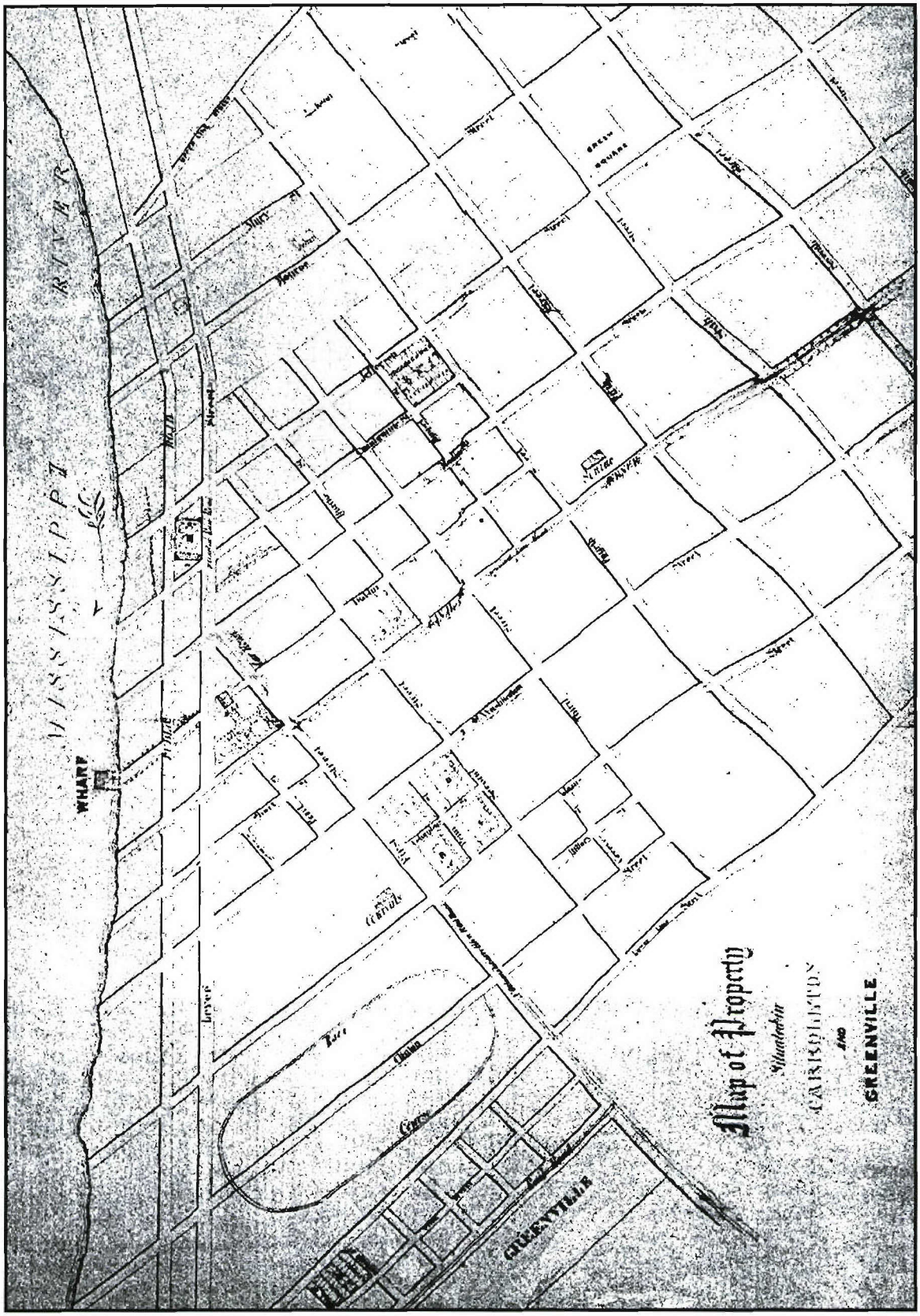


Figure 14. Although the riverside project area cannot be seen in this undated map, ca. 1840, the race track and Dublin Street wharf in Carrollton can be seen. All the land between the river and land side of levee street became batture in the 1890s (excerpted from Perilloux 1945).

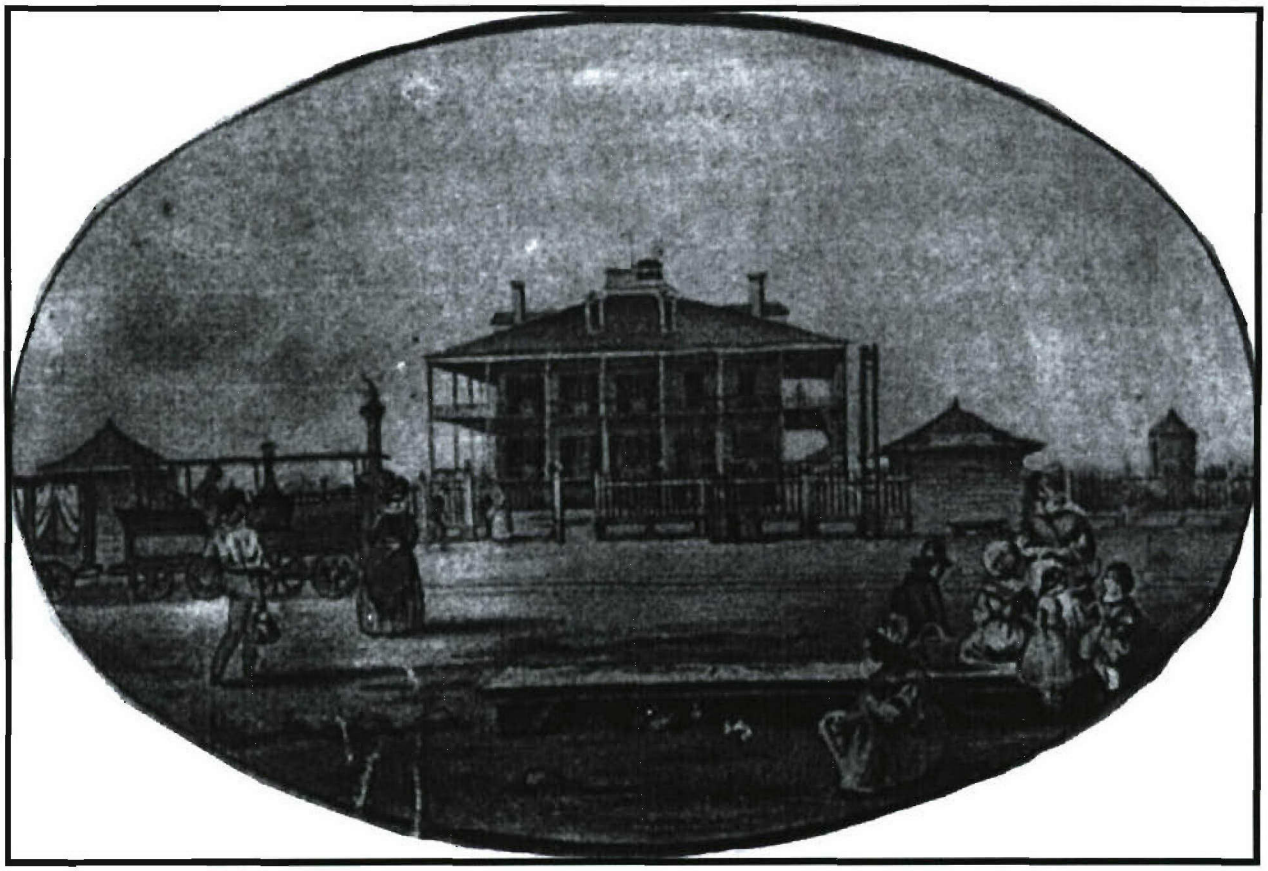


Figure 15. **The Carrollton Hotel and Gardens, pictured here from ca. 1840, were an important impetus to the growth of the Carrollton and Greenville neighborhoods (excerpted from Guilbeau n.d.).**

found tied up along the Carrollton waterfront, attesting to the increased importance of this stretch of the river to the region's economy.

Additional commercial and residential traffic in and to the Greenville/Carrollton area necessitated increased transportation access to the area. The success of the New Orleans and Carrollton Railroad appears to have inspired emulation, because work began on the Jefferson and Lake Pontchartrain railroad in 1851. Completed in 1853, the line ran from Carrollton along the current boundary between Orleans and Jefferson parishes to the lake. The president of the new railroad, G. Currie Duncan, successfully petitioned the Carrollton Council to set aside a portion of the levee between the lower line of Canal (Carrollton) Avenue and the upper line of Jefferson (Joliet) Street for steamboats only. As a result, the Jefferson and Lake Pontchartrain Railroad maintained a landing on the river for transporting passengers to the Carrollton Hotel and for moving cargo to and from Lake Pontchartrain. The railroad remained in operation until the eve of the Civil War; it was abandoned in 1864 for lack of profitability (Mahé 1976:114-116; Swanson 1975:98).

As was the case with recreational use of the area, the lumber industry became a crucial commercial enterprise in the development of the Greenville and Carrollton neighborhood during the early nineteenth century. Samuel Short, an early settler on the former Macarty Plantation, erected the first lumber and shingle mill in the Carrollton area. It was situated on the corner of Canal and First (currently, Carrollton and St. Charles). Short developed the area currently bounded by the Mississippi River, St. Charles Avenue, Carrollton Avenue, and Fern Street, before he lost his financial holdings in the Panic of 1837 (Mahé 1976:71-74). Subsequently, Frederick A. Raslar became known as the father of the wood yard business in the Carrollton/Greenville area. Raslar established a wood yard and sawmill at the head of Monroe Street in the upper section of Carrollton. By virtue of his location, Raslar had the advantage of selecting the first of the floating timber as it came down the river. The batture along his property contained a large basin of water with two outlets to the river. Logs collected in this basin supplied the sawmills behind the levee. Nevertheless, the basin created problems for the neighborhood by threatening the structural integrity of the levee. In 1853, a new levee was built, and Raslar was required to move his business. He relocated his lumber business to the foot of Joliet Street (Ledet 1938; Mahé 1976:76-77). Another sawmill stood at the corner of Carrollton Avenue and Commercial Street, and Frederick Fischer operated a lumberyard in Greenville, at the junction of Millaudon and Cherokee Streets.

In addition to the above-referenced business enterprises, one of the signals of economic development in the Carrollton/Greenville area was the creation of major commercial thoroughfares. Levee Street, a nineteenth century roadway that no longer exists, served as the major commercial street in Carrollton from the inception of the town until almost the turn of the twentieth century. In 1845, the newly incorporated Carrollton City Council designated Levee Street as "an important public street;" however, until the following year, the thoroughfare was not opened. Levee Street ran along the river near the lumber industries, and it intersected all the streets running to and from the Mississippi River (Figures 16 and 17).

Before 1853, businesses flanked both sides of Levee Street. The main commercial establishments were situated between Madison (Dante) and Cambronne Streets. Nevertheless, the construction of a new levee in 1853 required the demolition or removal of all standing structures along the riverside of the thoroughfare. Levee Street continued to prosper thereafter, albeit with businesses only on the side of the street farthest from the river. The owners of property along the new levee between Upperline Street (now Monticello Street) to Washington Street (now Fern) filed suit against the city for damages incurred by the construction of the new levee. The Supreme Court ordered that the property owners were entitled to compensation for their buildings, but that, as they continued to hold title to the property along the river, they remained owners, and therefore deserved no remuneration (Ledet 1938:249).

The Civil War in the Project Area

Although no military engagements of any consequence took place in the immediate project area during the Civil War, the vicinity assumed

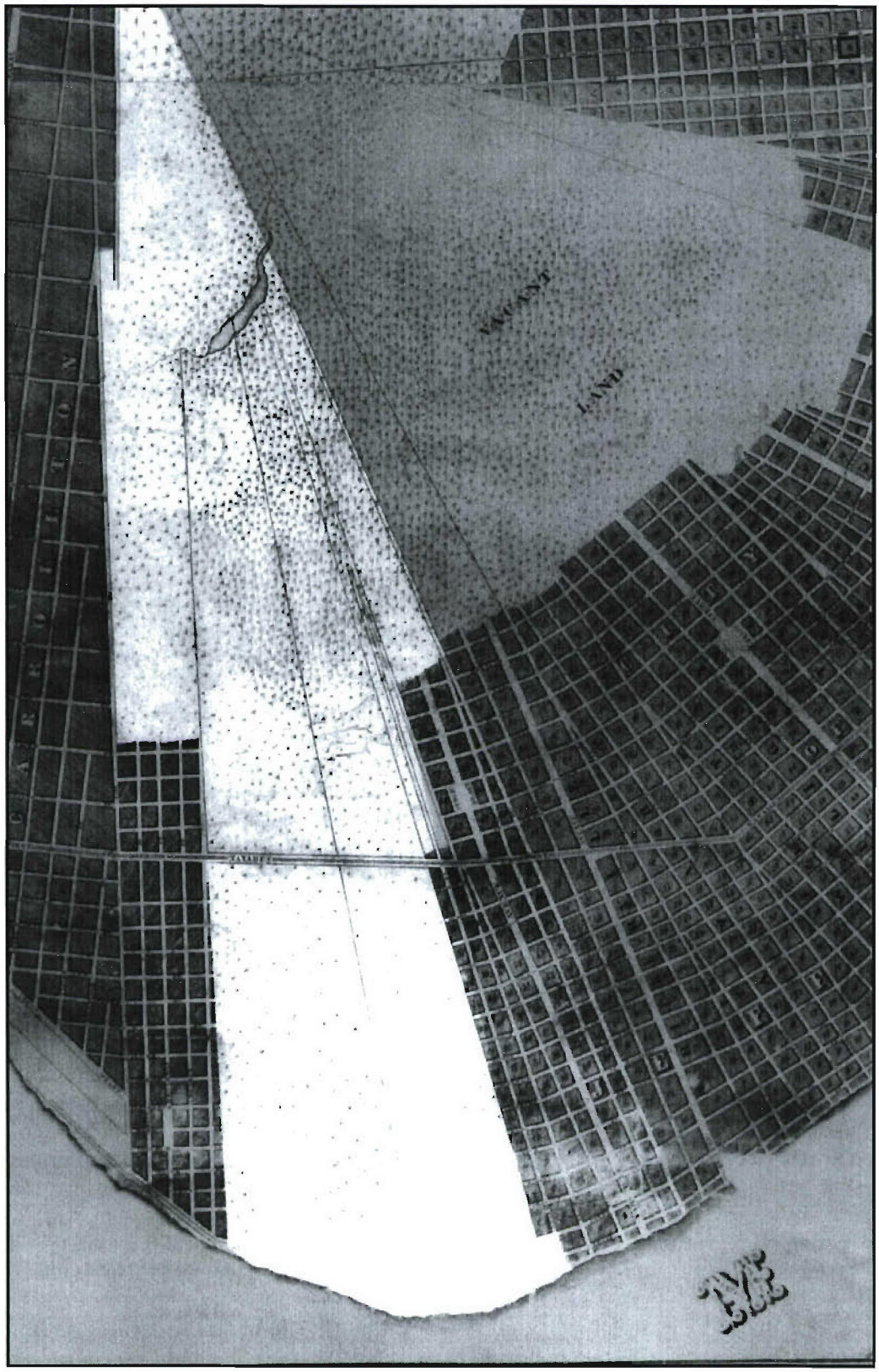


Figure 16. **The large batture area in front of Levee Street made it an ideal location for landing, stacking, and selling lumber (excerpted from Cangelosi and Schlesinger 1997).**



Figure 17. **This photograph of Levee Street, thought to be taken by George Francis Mugnier, around the turn of the century, shows Levee Street in the vicinity of Carrollton, after the 1890s levee was built (excerpt from the George Francis Mugnier Photographic Collection, Orleans Parish Public Library, Louisiana Division, City Archives).**

importance in defending the upriver approaches to New Orleans, as well as the location of several training grounds and ancillary military facilities. The Confederates began to build fortifications in and around New Orleans in 1861, directly after Louisiana seceded from the Union. The most famed of these facilities was the breastworks situated along the present route of Causeway Boulevard, called "Camp Parapet." In September 1861, the New Orleans *Daily Picayune* described the parapet as nine feet high with a moat thirty feet wide and six feet in depth. On March 21, 1862, the fortifications were named Fort John Morgan. After the capture of New Orleans, Federal forces changed the name to Camp Parapet and used the fortifications for both defense and as an occupation garrison (Figure 18). As discussed below, the presence of large numbers of African American soldiers garrisoned at Camp Parapet makes the location noteworthy for African American history.

However, closer to the project area, and of more interest to the current study, the Confederates began constructing Camp Lewis in June, 1861. The camp was named in honor of Major General John L. Lewis, the commanding general of the 1st Division of Louisiana Militia, and former Mayor of New Orleans. Colonel A. J. Powell, quartermaster of the 1st Division of Louisiana Militia, was charged with selecting a location "in the vicinity of New Orleans with ample water supply for a camp of instruction for the Orleans Battalion of Artillery and the Regiment of Orleans Guards" (Casey 1983:104-105). The position he selected was on the abandoned plantation of Louis Foucher, and now is encompassed by Audubon Park, adjacent to the current Carrollton Revetment project area. It was "on the [New Orleans and] Carrollton Railroad near the settlement of Greenville and about one and one-half miles below Carrollton in the Parish of Jefferson" (Casey 1983:105).

Colonel N. Augustin laid out Camp Lewis, building bridges across plantation canals, and raised a sixty-foot flagpole on the campgrounds. He also arranged for a Mississippi River boat to pump water into the camp every day, at a cost of almost $500 per week. When Augustin had completed the modest construction, consisting primarily of cheap, wooden flooring for military tents, he was succeeded by Brigadier General Charles A. Labuzan of the Louisiana Militia. Labuzan then oversaw the training of the Orleans Battalion of Artillery, the Regiment of Orleans Guards, Captain W. I. Hodgson's 5th Company of the Washington Artillery, the Orleans Rifle Battalion, six companies of the Orleans Blues, thirteen independent companies, the Beauregard Regiment and the Lovell Regiment (Casey 1983:105).

Though located a few miles distant from the city, Camp Lewis became a part of the social milieu of New Orleans before the Federal Army overtook the city. According to one historian, "social life in the urban centers, especially New Orleans, was greatly colored by military activities....[a]ttending drill, watching parades, visiting camp, seeing soldiers off, and promoting military benefits helped to enliven the social scene" (Winters 1963 [1991]:27). Some camps held large dress parades in order to encourage civilian participation. For example, on the 4th of July, 1861, Camp Lewis held a "grand review" and holiday feast. Contemporary reports indicate that as many as ten thousand New Orleanians rode the streetcar to the encampment to witness the spectacle (Forman and Logsdon 1985:86; Winters 1963 [1991]:27). One visitor, who rode the street railway up St. Charles Avenue in October 1861, described the camp rather idyllically: "the Camp looked so inviting. The pretty white tents, wide spreading trees and bright sun gave a picturesque appearance" (Clara Solomon, quoted in Hughes 1997:7).

Camp Lewis was abandoned when New Orleans fell to Federal troops in April, 1862. According to the journal of Union Colonel Halbert E. Paine, the Federal camp known as Camp Kearney may have been situated on the grounds of the old Confederate bastion (Casey 1983:100). Camp Kearney was described as being "one-fourth mile from the levee and near the N. O. and Carrollton Railroad...near or a short distance from Camp Mansfield" (Casey 1983:100). The location of Camp Mansfield has not been precisely pinpointed; accounts by Federal troops encamped there indicated that it was "low and swampy," and that it was situated "a short distance from the landing at Carrollton" (Casey 1983:116). This probably refers to either the wharf and ferry landing at the foot of Jefferson (now Joliet) Street, or the wharf at the foot

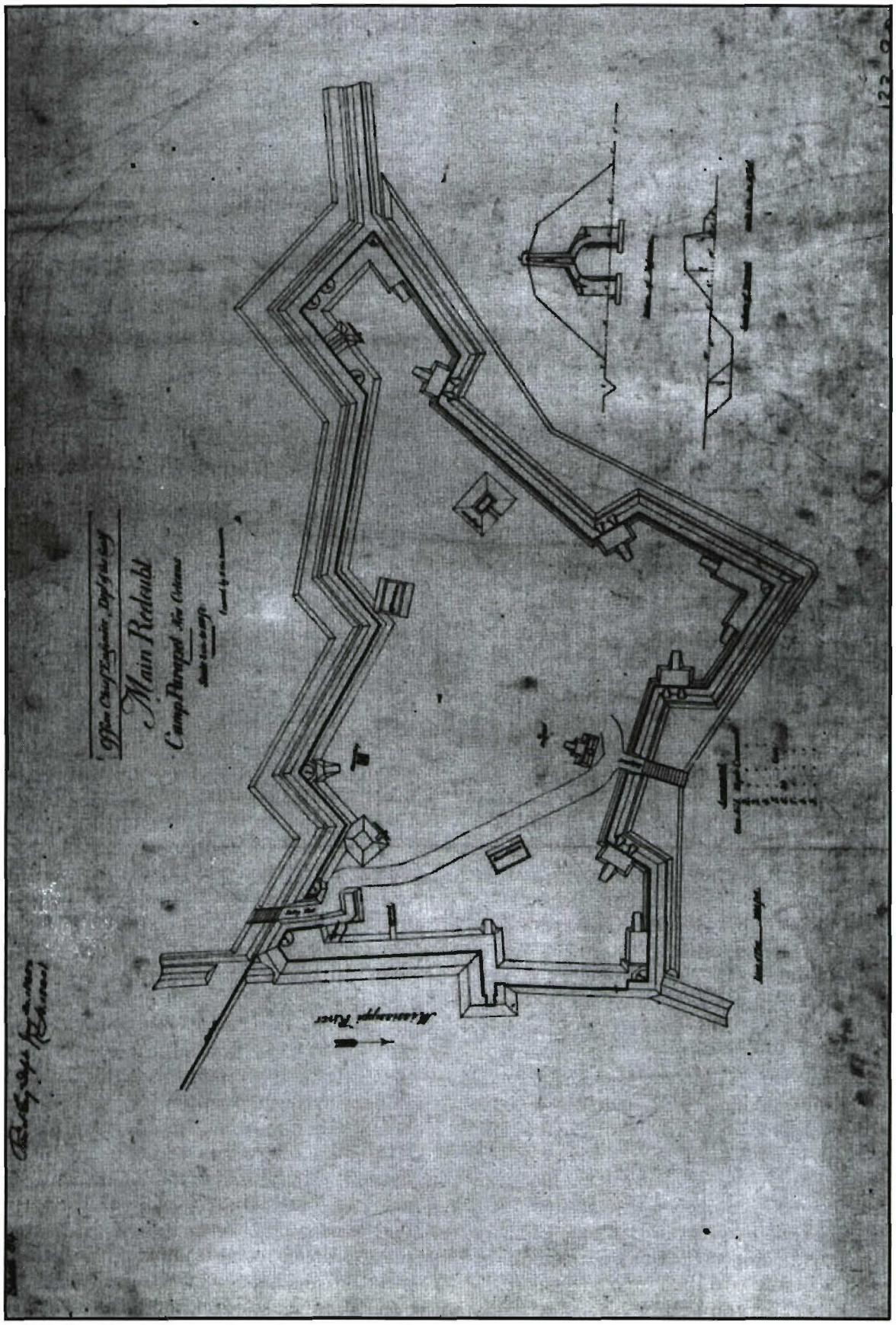


Figure 18. Camp Parapet, just a few kilometers upriver from the project area, played an important role in the integration of the Union forces during the Civil War. This experience, in turn, contributed the creation of the Buffalo Soldiers units, and their placement in New Orleans (excerpted from Casey 1983).

of Dublin Street; both landings were located upriver from the current project area (Figure 19).

During the war, New Orleans was the headquarters of the Department of the Gulf. As the Federal occupation of the city stretched on, the issue of the treatment, employment, and military enrollment of escaped slaves became a problem in the city and its environs. Camp Parapet, though located a few miles upriver from the current project area, played an important role in this debate, and, therefore, in the history of African Americans in the war and postbellum society. One of the first attempts to organize black units occurred at Camp Parapet during the Summer of 1862. Later in the course of the war, black regiments formed the majority of the garrison at Camp Parapet. Moreover, the organization of African American troops at Camp Parapet during the Federal occupation of the city set a precedent for black service in the military during and after the war, and became a working model for the Reconstruction plan implemented by President Lincoln.

Shortly after the Union overtook Camp Parapet, fugitive slaves began to enter the camp. Thousands of these slaves who escaped their plantations wanted to fight for the Union. General Benjamin Butler, the ranking officer in occupied Louisiana, at first resisted the notion of African American soldiers. Initially describing slaves who crossed Union lines as "contraband," Butler urged his subordinate, General John Walcott Phelps, the camp commander at Camp Parapet, to stop accepting runaway slaves, and to use those slaves under his protection for "fatigue labor" (Ripley 1976:104). Butler issued an order excluding unemployed African Americans from the military camps, which Phelps ignored. He sheltered African Americans who came into the camp, and used able-bodied workers to repair the fortifications (Greene 1982:293). Phelps, an uncompromising abolitionist, requisitioned "arms, accoutrements, clothing, camp and garrison equipage . . . for three regiments of Africans" (Ripley 1976:104).

Butler cautiously declined, unwilling to proceed without specific presidential approval. The issue of fugitive slaves at Camp Parapet eventually reached the War Department and the President. In July 1862, the President supported Phelps's decision to provide shelter for African Americans at the post. The Secretary of War, Edward Stanton, wrote to General Butler that,

> He [Lincoln] is of opinion that, under the law of Congress, they cannot be sent back to their masters; that in common humanity they must not be permitted to suffer for want of food, shelter or other necessaries of life: that to this end, they should be provided for by the Quartermaster's and Commissary's Departments; and that those who are capable of labor should be set to work and paid reasonable wages.
>
> In directing this to be done, the President does not mean, at present, to settle any general rule in respect to slaves or slavery, but simply to provide for the particular case under the circumstances in which it is now presented (Butler 1917:2:41-42).

Butler complained to his wife that the presidential support of Phelps would result in a slave insurrection (Butler 1917:2:41-42, 109).

Phelps would soon create even greater consternation for Butler. On 30 July 1862, he wrote to Butler from Camp Parapet requesting arms and accoutrements for three black regiments that he was organizing. He argued that his men were dying at the rate of two or three per day, and that regiments of fugitive slaves were necessary to find sufficient soldiers. Butler responded by adamantly refusing permission to arm fugitive slaves, pointing out that the Federal government rejected a similar request from islands captured by the Union on the Atlantic coast. He directed that Phelps continue to employ African Americans in repairing the earthworks and in cutting trees surrounding the camp. After a bitter exchange of notes, Phelps resigned in protest of Butler's policies (Butler 1892:488-490; Butler 1917:2:125-127, 142-146; Cornish 1956:58-62).

Perhaps the conscientious objections articulated by Phelps swayed Butler in the end. Shortly after Phelps resigned, on August 22, Butler organized the first African American regiment in the Army. He recruited the Native Guard, a group of free men of color from New Orleans who had formed a Confederate regiment under white threats, to join forces with the Union. Re-commissioned on September 27, 1862 as the 73rd United States Colored Infantry, the regiment became the first regiment of African Americans mustered into the Union. Nathaniel

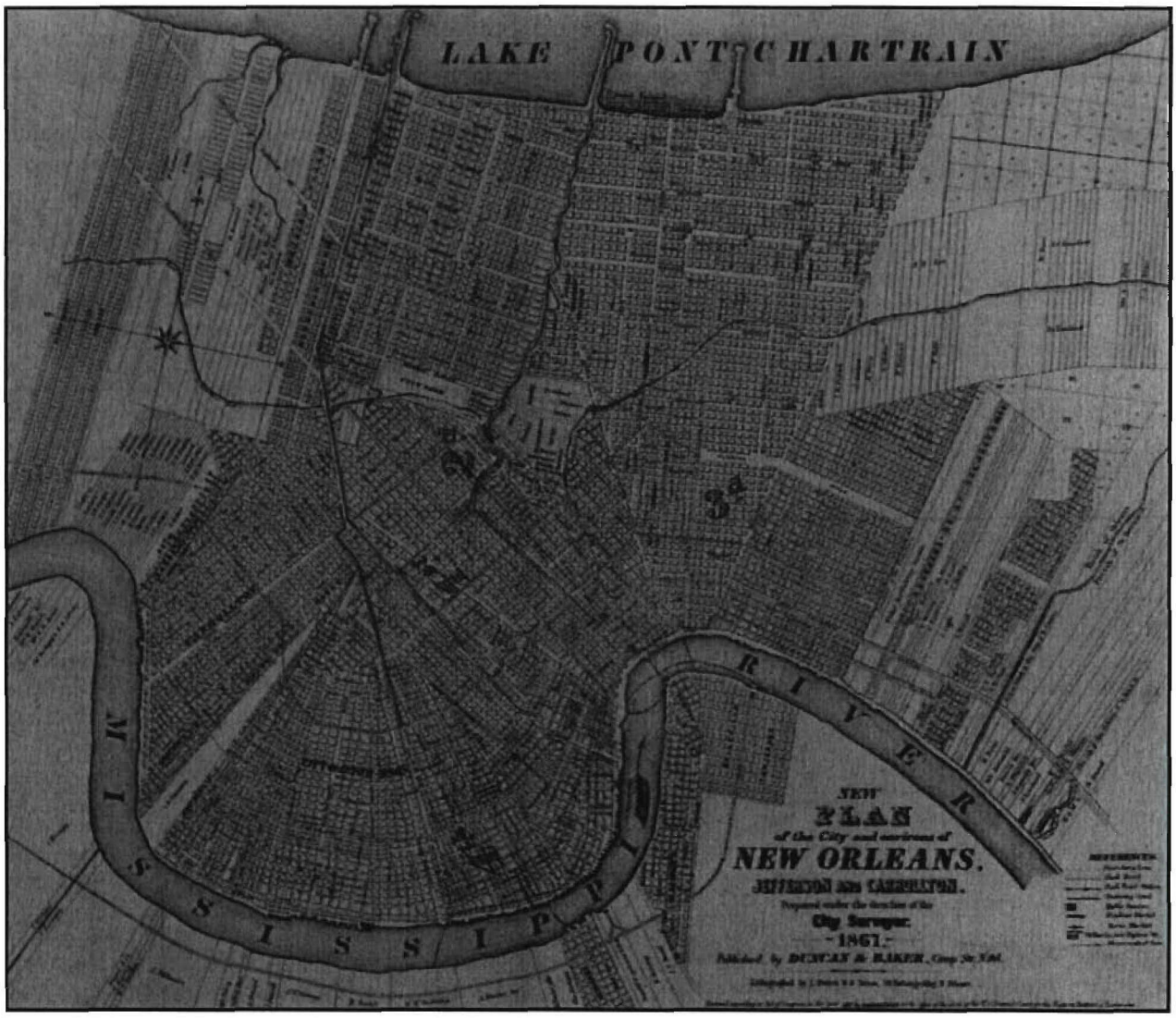


Figure 19. **This 1867 map of New Orleans, published by Duncan & Baker, depicts two wharves upriver of the project area, in Carrollton. Note that no wharf appears in the vicinity of the current project area (excerpted from Forman and Logsdon 1985).**

Banks, who succeeded Butler, subsequently reorganized the African American regiments into the *Corps d'Afrique* [African Corps].

Just a few months later, in January of 1863, Lincoln issued the Emancipation Proclamation. Unfortunately for Louisiana slaves, those parishes under Union control, including Orleans and Jefferson, were exempted from the edict. For a period, the Federals were interested both in maintaining the labor of slaves and in placating the concerns of conservatives in Congress. Ironically, that meant that the slaves still in the Confederate territory were free, while those who lived in areas held by the Federals still were enslaved.

Clearly, the Union soldiers were not the saviors that many slaves had anticipated, and the white Confederates had feared. In fact, many African Americans were rounded up by men in blue and forced at gunpoint to recruitment stations. In New Orleans, a free man of color, P. Bourgeois, resisted Federal soldiers' efforts at recruitment, whereby they "beat him, knifed him three times and took him away" (Ripley 1976:109). On plantations, as well, Union soldiers impressed both free African Americans and slaves into service.

Despite these hardships, former slaves in Louisiana fought with courage against their former captors. One historian estimates that at least 15,000 African American troops fought for the Union in the Pelican State, although former Governor Warmouth surmised the number was over 18,000 (Ripley 1976:108). In battles all over the Louisiana theatre, former slaves earned distinction and, in some cases, the reluctant respect of both their allies and enemies. One Confederate soldier who fought against *Corps D'Afrique* troops at Milliken's Bend, for example, grudgingly acknowledged that the African American soldiers "fought desperately and would not give up until our men clubbed muskets upon them" (Ripley 1976:123). Indeed, African Americans in the service of the Union had a good reason to fight desperately. Many who were captured by the Confederacy were summarily shot, hanged, or re-enslaved. Consequently, African American troops were especially willing to take every chance to survive on the battlefield, rather than face death or recapture. Moreover, *Corps D'Afrique* members were "more apt to attempt battlefield rescues of the wounded," knowing full well what fate lay ahead for captured soldiers (Ripley 1976:123).

In 1864, the year after the Emancipation Declaration took effect, the Federals formed a new encampment in the Greenville area. Greenville Barracks, also known as Sedgwick Barracks, included quarters, a cavalry camp of instruction, and a hospital. One historian has noted that the hospital building, also known as Sedgwick General Hospital, was built on the location of the first residence of Pierre Foucher, which was torn down to make room for the facility (Casey 1983:71). However, this seems unlikely, for two reasons. First, the initial Foucher dwelling was located in Greenville, i.e., that portion of land that Foucher sold to Ogilive in 1834, as noted above. Second, Foucher sued the Federal government after the war for damages to his property, including the destruction of his plantation home. Hence, it is likely that Greenville or Sedgwick Barracks was situated on the location of the second Foucher plantation dwelling. This is the same tract that his son, Louis Foucher abandoned, and that eventually became Audubon Park.

When the Cavalry Camp of Instruction at Greenville opened in 1864, it is likely that Federal troops were in the process of demolishing the old Foucher house, and of building the barracks and the Hospital in its place. By June 1864, the Quartermaster of the Department of the Gulf reported "the Sedgwick hospital has been constructed and finished with gas, water, and most recent improvements" (Official Records of the Union and Confederate Armies, Series I, Volume XLVIII/2 [S #102]). Carrollton historian William H. Williams noted in 1876 that the imposing Foucher house "was destroyed during the late war to make room for a military hospital" (quoted in Wilson 1997:30). Further proof of the location of Camp Sedgwick lies in the fact that, in the wake of the war, Louis Foucher (and, later, his widow) commissioned a survey of the damages resulting from the Federal construction, amounting to a total of $88,449 (Forman and Logsdon 1985:86). While the records of the lawsuit alleging these damages (Civil District Court Case # 2036) no longer can

be located in the City Archives, a secondary source quotes from the succession of Louis Foucher, indicating the extent of the damage:

> ...during the military occupation, buildings and improvements thereon, the ferries, outhouses, bricks and brick sheds, and other material either [were] removed or destroyed by said troops or used by them in the erection of said property of Sedgwick Hospital and Barracks, which buildings were afterward removed or sold by the troops (quoted in Irvin 1997:39).

The *Daily Crescent* newspaper commented on the former location of the Foucher dwelling, on June 13, 1866, stating "The United States government, properly estimating the beautiful and healthy location of the vicinity, has thereabout established a military health recruiting station, or an asylum for military invalids" (quoted in Wilson 1997:31) (Figure 20). A close examination of the 1834 Zimpel map shows the former location of the Foucher residence and outbuildings, the probable location of the Sedgwick Hospital and Barracks.

It is not certain whether the location of the barracks and/or cavalry stables was on the same grounds as the hospital or not. However, a close examination of Figure 20 above, depicting the hospital, clearly shows long, one-story housing elevated on piers. Although these detached structures could be related to the hospital, they also could be the "Greenville Barracks." Additional information can be gleaned from Figure 21, which shows the "U. S. Cavalry Stables near Carrollton" (Figure 21). Two sets of railroad tracks are visible in the photograph, one in the foreground, and one running parallel to the front of the stables in the background. The Foucher property was known to have a railroad spur, connecting with the New Orleans and Carrollton Railroad at Nayades Street (St. Charles Avenue) (Wilson 1997:30). It is possible that this spur is the same rail line that is depicted in this photograph. However, the Quartermaster of the Department of the Gulf reported in the Summer of 1865 that "cotton presses have been converted into barracks for troops and prisoners; into stables for cavalry; extensive stables have been erected" (Official Records of the Union and Confederate Armies, Series I, Volume XLVIII/2 [S #102]). This would suggest a camp location close to the river, where cotton presses were located. The Foucher spur probably was located closer to St. Charles Avenue, and the streetcar. Ultimately, without further documentary information, no conclusions regarding the precise location of the cavalry camp can be drawn.

Although the exact locations of the Sedgwick Barracks and General Hospital remain elusive, they played a crucial role in the postwar organization of the military. The first construction noted for the Federal facility was the Cavalry Camp of Instruction, which formed no later than June 9, 1864, when 2,641 cavalrymen were stationed there (Figure 21). As soon as the war ended, the confluence of the cavalry training camp and the history of African American military recruitment in New Orleans converged. On July 28, 1866, Congress abolished all volunteer African American Civil War regiments; however, "in recognition of the contributions made by almost two hundred thousand black soldiers to the Union Victory," they established six peacetime regiments of African American troops (Kenner 1999:9). These companies consisted of the 9th and 10th Cavalry, as well as the 38th, 39th, 40th, and 41st Infantries (later consolidated into the 24th and 25th Infantry). These were the first African Americans to serve the United States in the regular, peacetime Army. The first of these units mustered, the 9th Cavalry, was organized by General Phillip Sheridan, commander of the Division of the Gulf, in New Orleans. They formed at the Greenville Barracks. The company went on to become one of the legendary companies of the "Buffalo Soldiers."

The first recruitment station for these African American regiments was established in New Orleans in August 1866. New Orleans was a natural choice for a base of operation for a number of reasons. First, because the city had been occupied by Federal troops for several years by the time the war ended, historians suggest that in many ways, Louisiana during the war was an experimental model for postbellum Reconstruction. In fact, as noted above, the Union soldiers and the occupation government had many choices to make regarding the status and role of freed African Americans during the period of Federal control in the Pelican State, and the "ten percent" yardstick Lincoln used for readmission



Figure 20. **This photograph depicts Sedgwick General Hospital in 1865. The hospital was located on the property of Louis Foucher, in the vicinity of modern-day Audubon Park (excerpted from Casey 1983).**

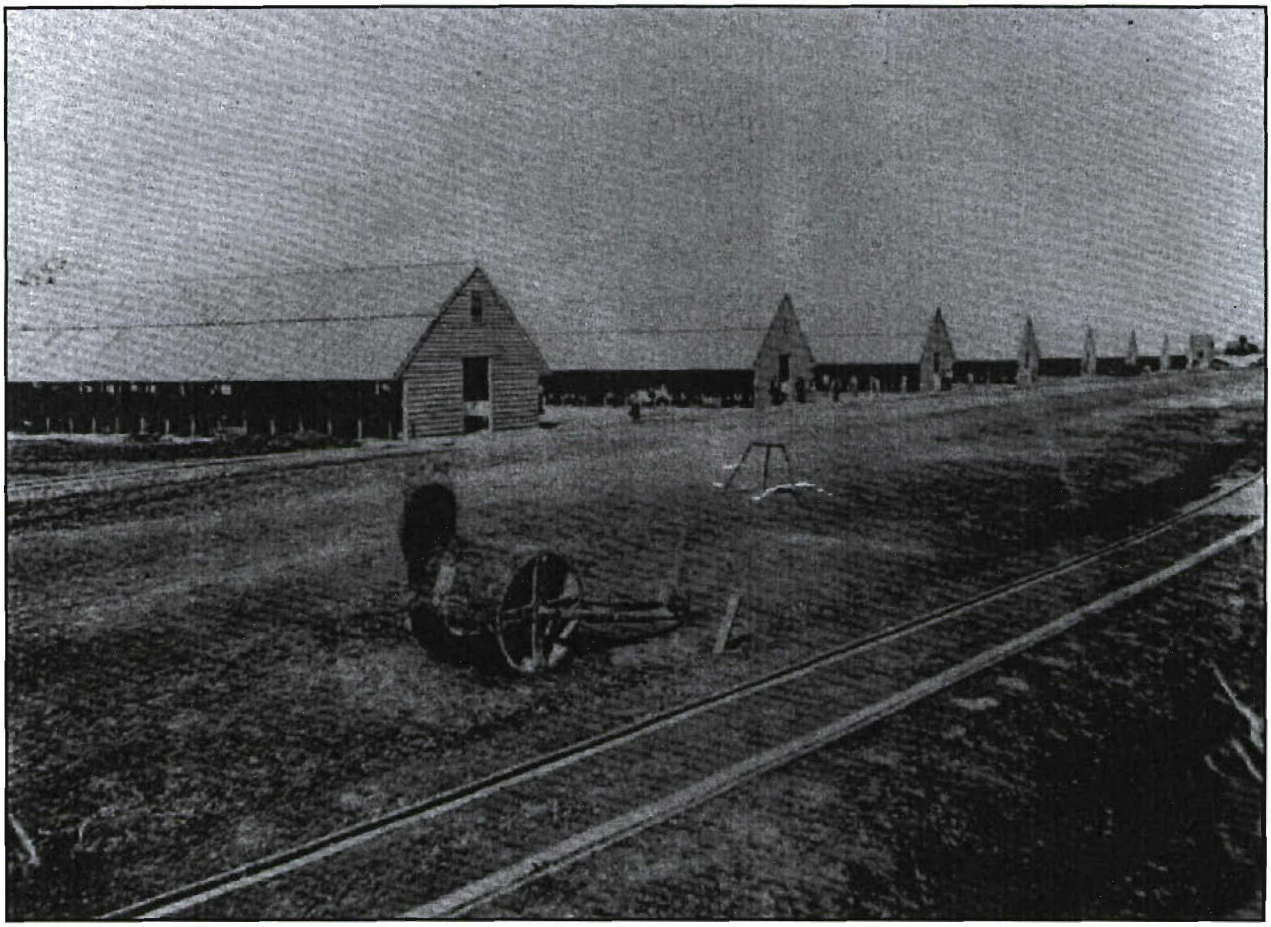


Figure 21. **The U. S. Cavalry Stables were located near Sedgwick General Hospital in Greenville. This is where the 9th United States Cavalry Regiment, the first "Buffalo Soldiers" unit, trained (excerpted from Casey 1983).**

to the Union was based on a Louisiana model (Ripley 1976:159-162). In addition to serving as a Reconstruction model, during the war, Camp Parapet was the first location in which an African American regiment was mustered into the United States Army, as mentioned above. The city was a major discharge locus, especially for the estimated 18,000 African Americans who served the Union from the Pelican State (Ripley 1976:108). Finally, because a cavalry training facility already existed in the city, New Orleans was the logical choice for the first "Buffalo Soldier" recruitment station.

Because the recruiting station was located in an area where a large number of African American Union troops originated and were released from duty at the close of the war, the location of the Cavalry Instruction Camp dramatically affected the demographic organization of the initial unit. For example, when the 9th Cavalry Regiment was established, at least 40 percent of the recruits were veterans of the Civil War (Kenner 1999:11). In that first year, the majority of enlistees were natives of Louisiana, many discharged from voluntary service to the Union (Hutcheson, in Rodenbough and Haskin 1897:280; Kenner 1999:11). One source notes that Major Francis Moore of the 65th Colored Infantry was put in charge of recruitment in New Orleans, and that, "the men obtained by Major Moore formed the nucleus of the enlisted strength, and were principally obtained from New Orleans and its vicinity" (Hutcheson, in Rodenbough and Haskin 1897:281). Moreover, because Major Moore proved to be such a successful recruiter in the city, even after a new recruiting office was established in Kentucky, the majority of those new recruits "were obtained from that state and Louisiana" (Hutcheson, in Rodenbough and Haskin 1897:281).

In a struggling economy, and the swirling disarray of the early Reconstruction political system in New Orleans, many new members of the 9th probably were seeking the steady employment and security of military service. The Army paid members of the unit between $13 and $16 per month, and provided food, lodging, and clothes (Farrell 2001:1; International Museum of the Horse 1996:1). In return for such a large salary and security, each recruit pledged at least five years to the military.

The Army Organizational Act "to increase and fix the military peace establishment of the United States," which established the 9th and 10th Cavalry, specified that the organization of the units would be identical to that of the "regular" cavalry units (Hutcheson 1897:280). The act did not specify that the regimental officers were to be white; however, the stipulation was implied. During the first few months of the existence of the Regiment, very few officers were willing to accept the appointment. Despite offers of rapid advancement and additional salary incentives, a number of white officers declined the command, including George Armstrong Custer and Frederick Benteen (International Museum of the Horse 1996:1). This advertisement from the Army and Navy Journal underscores the attitudes of the white officers of the time:

> A first Lieutenant of Infantry (white) stationed at a very desirable post....desires a transfer with an officer of the same grade, on equal terms if in a white regiment; but if in a colored regiment, a reasonable bonus would be expected (International Museum of the Horse 1996:2).

One historian of the 9th suggests that, "most of the difficulties in training camps were primarily the result of the scarcity of officers" (Kenner 1999:11).

Another difference between white and African American mounted regiments was the assignment of a permanent chaplain to each of the black units. The act specifies that in addition to tending to the spiritual needs of the men, the chaplain was to be responsible for the instruction of all the enrollees. Presumably, for many enlisted men, service in the cavalry also provided the basic education not available to them prior to emancipation (Hutcheson 1897:280). Eventually, the second African American officer in the nation to be commissioned by the Army was Henry Plummer, a regimental chaplain detailed to the 10th United States Cavalry unit, the second Buffalo Soldier outfit.

By September of 1866, the majority of the new 9th United States Cavalry Regiment was assembled in the New Orleans region. One source indicates that the unit initially was housed in the city, but moved to Greenville in September because a cholera epidemic was rav-

aging the city (Hutcheson 1897:281). Under the command of Colonel Edward Hatch, the 9th Cavalry Regiment was activated on September 21, 1866. The Winter of 1866-1867 was spent drilling, fixing organizational issues, and recruiting additional white officers. By March 1867, the unit was ordered to go to San Antonio, Texas. When they arrived in Texas in early April, they were charged with general military duties in the burgeoning west. Initially, their primary responsibilities included the protection of stage and mail routes, and the construction of forts and outposts. By late 1868, the Regiment was engaged in the battle for control of the Texas/Mexico border, and the early skirmishes of the new "Indian Wars." It was during this period that the Plains Indians gave the African American troops their famous moniker, likening their tenacity in battle, their tireless pursuit, and their pigmentation to the sacred animal that played a crucial role in their native culture.

Throughout the end of the nineteenth century, the fighting men of the 9th Cavalry, whose motto was, "we can, we will," went on to fight doggedly along the dangerous western frontier. They ran thousands of miles of telegraph wire, guarded isolated border forts, and escorted civilian wagon trains. According to a statement from the Assistant Director of Recreation and Conservation for the National Park Service, "they were responsible for opening millions of square miles of western lands to peaceful settlement and development" (Statement of D. Thomas Ross before the Subcommittee on National Parks of the Senate Committee on Energy and Natural Resources, June 19, 2003). The two regiments went on to fight with Teddy Roosevelt on San Juan Hill, in the Philippines, in China, and helped to capture Pancho Villa in Mexico. They fought Geronimo, Sitting Bull, Victorio, and Lone Wolf. They were officially disbanded in 1950, when President Harry S. Truman eliminated racial segregation in the armed forces.

The quest to lift the veil of racial prejudice drove many African Americans into battle during the Civil War, and many into the 9th Cavalry after the war had ended. Many African Americans believed that full and equal citizenship would follow from their military service to the nation. As Frederick Douglass put it, "Once let the black man get upon his person the brass letters, 'U.S.,' let him get an eagle on his button and a musket on his shoulder and bullets in his pocket, and there is no power of Earth which can deny that he has earned the right to citizenship in the United States" (Williams 2003, available online at http://www.nsamidsouth.navy.mil). Unfortunately, the Buffalo Soldiers were forced to contend with both the trials of the dangerous western frontier, and the terrible discrimination even from the officers in charge of their unit. The Assistant Director of the National Parks Service division responsible for the maintenance of historic monuments noted that the achievements of the first African American units to be commissioned in the regular, peacetime army historically have been overlooked:

> Until recent times, the Buffalo Soldiers received little recognition for their years of service on the frontier. The record of meritorious service and notable accomplishments amassed by the Buffalo Soldier regiments remain a symbol of hope and pride for all Americans. Their achievements serve as a reminder of the contributions they made to American life and culture (Ross 2003).

Ironically, in that same statement, the National Park Service declined to support a proposed bill, which would have authorized the construction of a Buffalo Soldier memorial in New Orleans.

What little research that has been conducted on the 9th does not provide substantial information on the organizational period the regiment spent in New Orleans. Additionally, very little mention of the unit while in Greenville can be found in any local newspapers or in secondary sources. The national Buffalo Soldiers Monument is located in Fort Leavenworth, Kansas (Figure 22), where the 10th Cavalry Regiment began, almost two months after the New Orleans cavalry unit formed.

> So look at this statue. Look at him. Imagine him in his coat of blue ... on his horse ... a pistol on his hip. Courageous iron will. He showed that the theory of inequality must be wrong. He could not be denied his right. It might take time--it did take time. But he knew that in the end he could not be denied.... But we are not here today to criticize an America of a hundred and fifty years ago, but to rejoice--to rejoice--that we live in a country that has permitted a spiritual descendant of the Buffalo Soldier to stand be-



Figure 22. **The National Buffalo Soldiers Monument is located in Fort Leavenworth, Kansas, where the Tenth Cavalry was created several months after the Ninth formed in New Orleans (photograph excerpted from Fort Leavenworth website).**

> fore you today as the first African-American Chairman of the Joint Chiefs of Staff (General Colin Powell, at the dedication of the Buffalo Soldier Monument, July 25, 1992, quoted in Williams 2003).

Postbellum Developments in the Greenville Area

Following the war, New Orleans and the Carrollton and Greenville neighborhood experienced a period of growth and municipal change. The Civil War stifled economic development in New Orleans. Rather than export goods produced on plantations, many landowners utilized their agricultural products for subsistence purposes; other materials were commandeered by Union or Confederate troops. This decline in marketable goods produced a debilitating effect on the port of New Orleans and associated industries (Beavers and Lamb 1980:31). Such a decline was solidified when the Federal embargo during the war essentially shut down the Mississippi River for trade. Following the war, the city slowly recovered and resumed shipping activities.

The agricultural component of the local economy also shifted after the Civil War, as the cotton market plummeted and sugar slowly regained its importance. Although sugar production experienced a slowdown during the 1870s, production of the crop increased significantly through the beginning of the twentieth century. Technological advances in sugar production and a reorientation of the organizational system from family management to modern corporate industrial management contributed to this increase (Goodwin et al. 1984:57,61). These staple crops were supplemented by rice, a relative newcomer to the Louisiana agricultural landscape. By the turn of the twentieth century, New Orleans was, once again, one of the busiest ports in the country.

The Greenville and Carrollton neighborhoods in the vicinity of the current project area changed in response to development in the City of New Orleans. The uptown neighborhoods between New Orleans and Carrollton, including Greenville, were incorporated into the city in 1870 (Figure 23). The City of Carrollton quickly followed suit; it was annexed to the City of New Orleans on March 23, 1874 (Swanson 1975:106). These neighborhoods constituted the preponderance of the 14th Ward of the city.

Following the Civil War, the main developments affecting the Carrollton Revetment project area were the construction of a new levee in 1891, the development of Audubon Park, and the creation of a wharf, ferry landing, and commercial facilities in Areas B and C of the area of potential effect. Because each of these developments significantly impacted the project area, and because these historical episodes have considerable archeological implications, each factor is addressed at length below.

New Levees for Carrollton and Greenville

The potential for encountering intact archeological resources within the project area is dependent on several interrelated factors, including lateral migration of the Mississippi River, distribution of historic development, disturbances to archeological resources caused by levee and revetment construction, and modern land-use. Levee and revetment constructions, construction of the New Orleans Public Belt Railroad lines that lie adjacent to the levee, and modern development of the area have damaged or destroyed numerous potentially significant archeological resources that originally were located along the river. Because few historic maps are available that depict the locations of the individual nineteenth and early twentieth century structures and businesses that were destroyed, anticipated archeological locations of most of these resources cannot be ascertained without extensive property-specific research; this lies beyond the scope of this study.

At one time, the foreshore terrestrial portion of the current Carrollton Revetment project area was several blocks from the river. Historic maps illustrate that riverfront areas were destroyed when the current levee structure was built, ca. 1891. In Carrollton, this levee setback destroyed the remaining buildings on Levee Street and resulted in removal of the buildings located on the landward side of the road. These buildings included numerous commercial structures such as the elaborate Gothic revival railroad depot, the New Orleans and Carrollton Railroad depot, and the popular Carrollton Hotel and Gardens. In the immediate project area, sev-

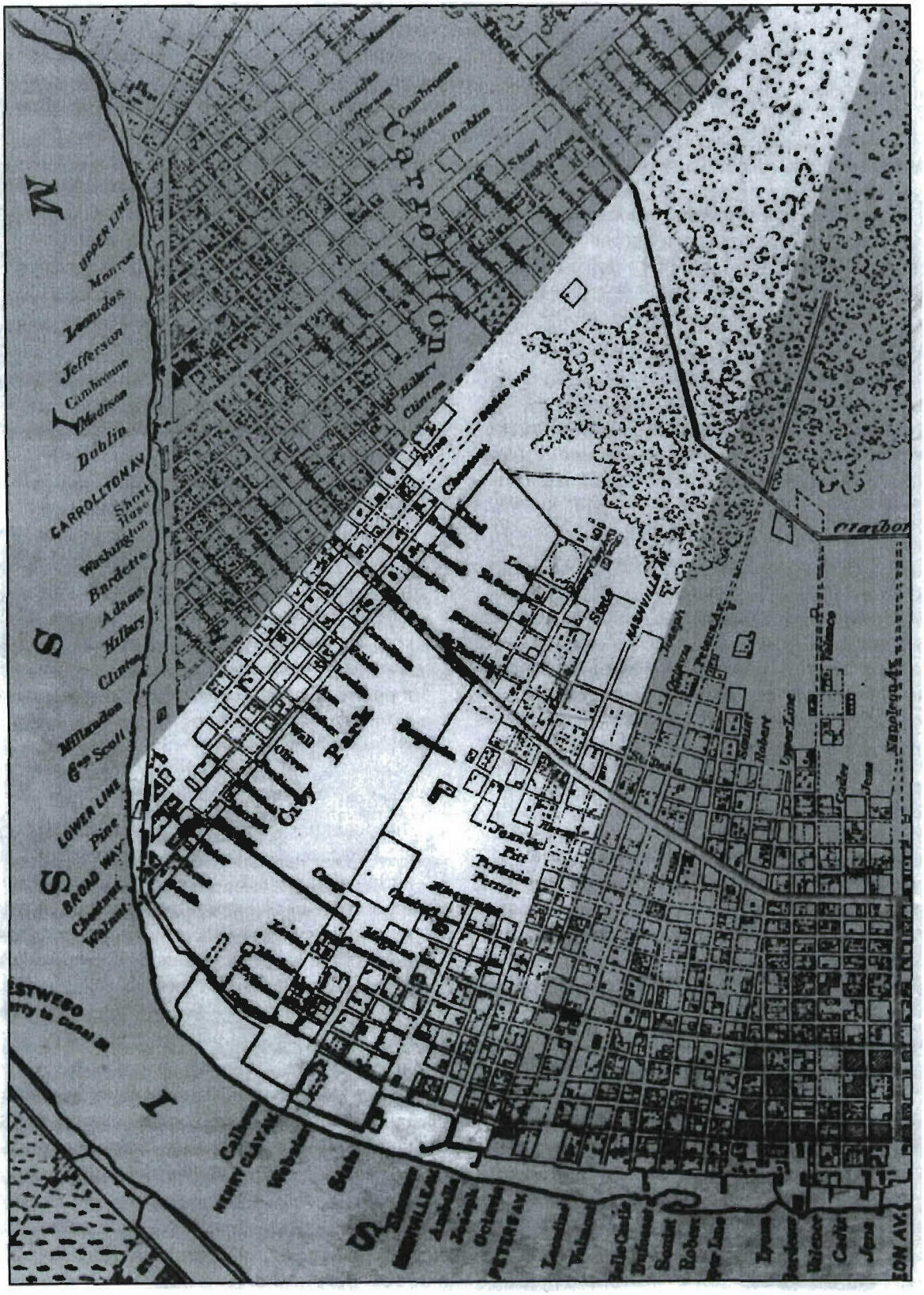


Figure 23. **This map, drawn by T. S. Hardee in 1880, depicts the limits of New Orleans after both Greenville and Carrollton were incorporated into the city. Note the structure at the foot of Walnut Street that might represent an early wharf (excerpted from Cangelosi and Schlesinger 1997).**

eral city blocks were expropriated for a levee setback, creating a larger batture area.

All along the riverside in New Orleans, the batture historically has been a public use area. The land alongside the river is an area in constant flux; it lies, as geologists have said, "between earth and sea, belonging to neither and alternately claimed by both" (Kelman 2003:28). The batture area flooded each high-water season, prompting New Orleanians to use the floodplain "as a source of much-needed landfill," to raise the level of private property above the surrounding swamplands (Figure 24) (Kelman 2003:25). Additionally, until the American Period, the batture served the city as an area of common storage.

The first controversy regarding batture ownership occurred just after the Louisiana Purchase, when a riverfront property owner, Jean Gravier, barred his riverside batture from public egress. His claim, argued by infamous New York attorney Edward Livingston, sought to restrict the batture from all public uses, and threatened to set a precedent of private ownership of riverside lands. The case eventually settled with a compromise—batture lands in Louisiana are privately owned, but subject to public servitudes for flood protection (levees) and commerce (landings and wharves) (Kelman 2003:25-49; Spier and Walker 2001:9-26).

The first known public servitude exercised in the project vicinity was the 1853 levee. Little is known about the construction technique or specification of this levee; however, the precise location of this bulwark is known. This 1891 map of the project area (Figures 25 and 26) depicts the location of the 1853 levee, as well as the location of the 1891 levee, setback from the crevasse in the old levee some 82.3 m (270 ft).

Unlike the rest of the Louisiana parishes, the levees in Orleans Parish were not planned, built, or maintained by Corps of Engineers; therefore, the Orleans Parish Levee Board, established in 1890, was the body responsible for the Carrollton/Greenville area at the time the 1891 levee was proposed. The lack of jurisdiction in regards to the Orleans Parish levees did not prevent the Corps from commenting on the state of the riverbanks in the Carrollton/ Greenville area. For example, in 1892, Corps engineers noted, "destructive caving" between Carrollton and Exposition Wharf, an area that includes the proposed project item and property upriver to the parish line. The engineers further noted, "the city of New Orleans has constructed pile work and wooden bulkheads with a view to arresting the caving..." (United States Army Corps of Engineers, Annual Report of the Chief of Engineers 1893: 3822). The report is vague on whether the pile work and bulkheads were in place along the east side of Greenville Bend, but it did state that the work was "partially successful" (United States Army Corps of Engineers, Annual Report of the Chief of Engineers 1893:3822). Perhaps the Corps was commenting on the 1853 levee (i.e., "pile work") that was in place along the shoreline (Figure 27). The proximity of the 1853 levee to the edge of the Mississippi River and the caving in the immediate project area were the major stimuli for the new levee (Figure 25).

The Orleans Parish Levee Board chose the new line for the levee between Broadway Avenue and Audubon Park in 1891. Local residents, who stood to lose both residential and commercial property, opposed the new levee and petitioned the levee board to repair and refurbish the existing flood control structure. However, larger safety issues outweighed the complaints of a few residents and the levee board pressed ahead with plans for the new levee *(New Orleans Times-Picayune*, September 19, 1891).

In 1891-1892, portions of the new levee in Greenville Bend were placed approximately 82.3 m (270 ft) landward of the extant 1853 levee, creating a wide batture (Figure 27). Adjacent to the project area, the levee setbacks in 1853 and 1891 destroyed the Public Road that ran along the old levee. Also destroyed were numerous commercial and residential structures (Figure 28). It seems likely that the land acquired for the new levee was used as borrow for the construction, a construction method used by the Orleans Parish Levee Board during the exact same period for the Carrollton Levee, just upriver (*New Orleans Daily Picayune*, September 19, 1891). Contrary to the general practice of removing the extant levee to use as fill for the new structure, the old levee was left in place and the ground between the levees was used as fill. The 1893-1894 Mississippi River Commission

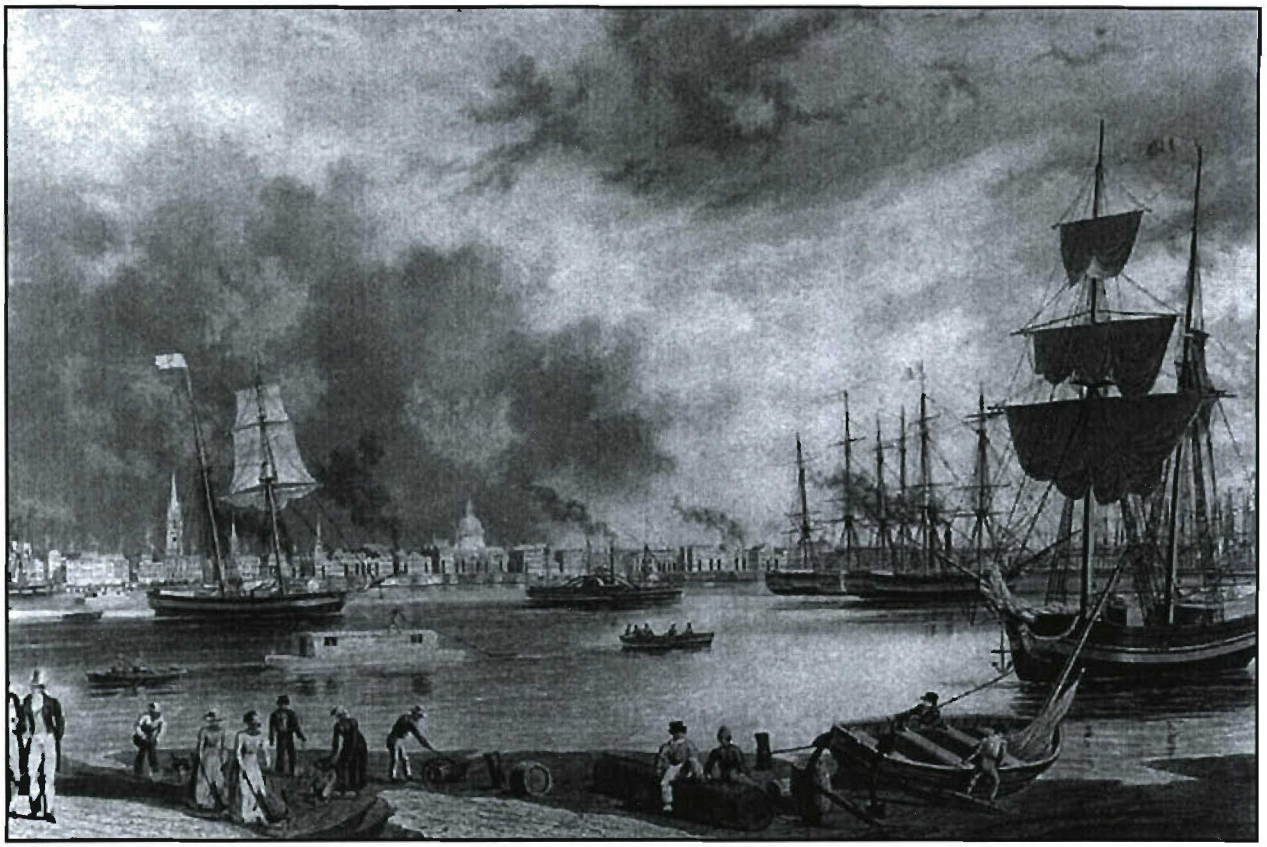


Figure 24. **[1841] During the antebellum era, New Orleanians used the batture as a storage site, promenade, and source of fill (excerpted from Kelman 2003).**

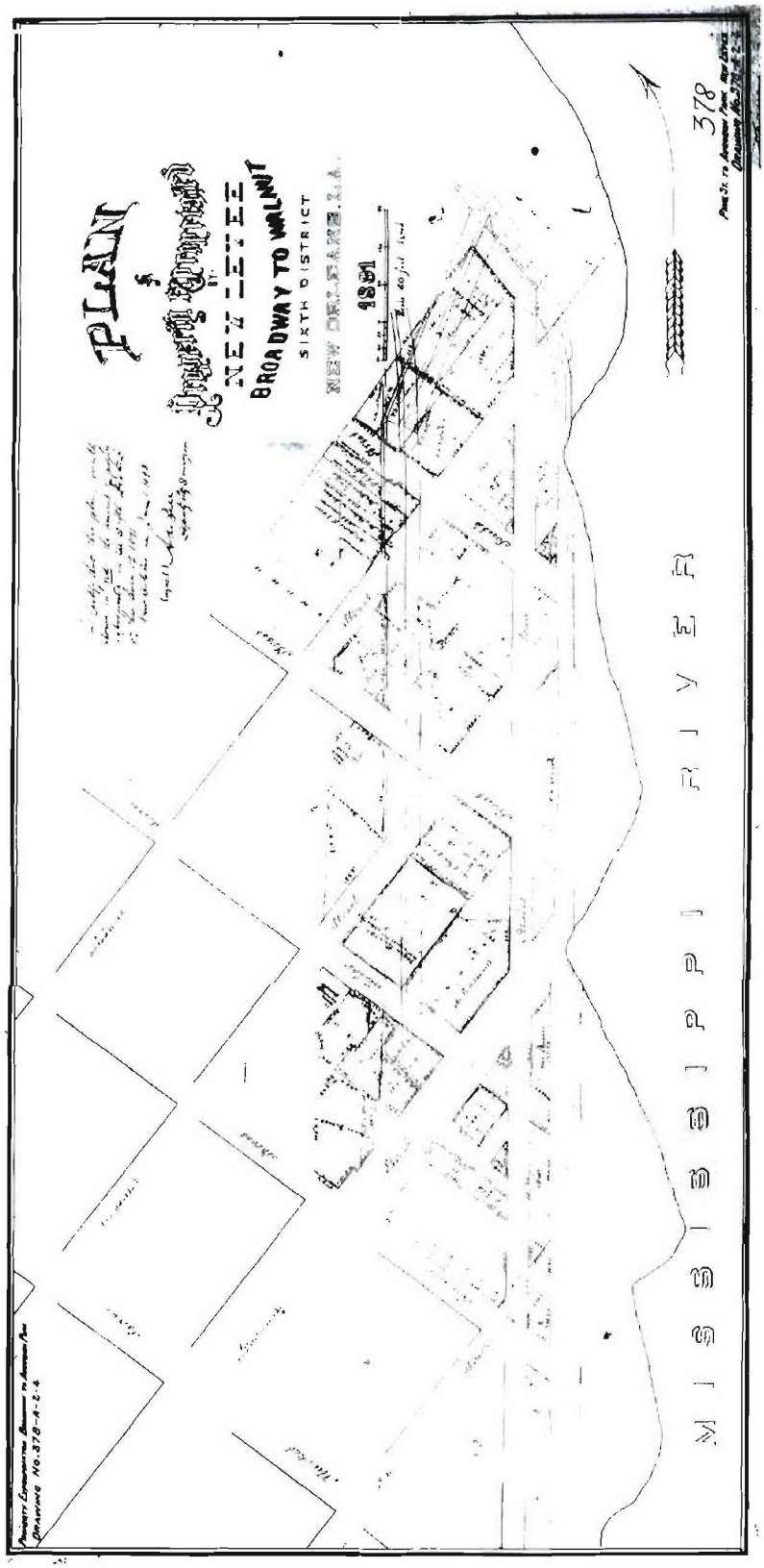


Figure 25. Survey conducted by A. C. Bell, Deputy City Surveyor, illustrates the riverfront in the vicinity of the project area before the current levee was constructed. Note the new levee is drawn in, depicting how many properties were expropriated and razed for the project (A. C. Bell, Orleans Parish Levee Board, Engineering Division, on file, 1891).



Figure 26. **This figure depicts the 1891 expropriation survey on a current aerial photograph, graphically illustrating the Area of Potential Effect within the area once located behind the 1853 levee (map excerpted from Bell 1891; photograph taken by Gandoifo, Kuhn & Associates, ca. 1970).**

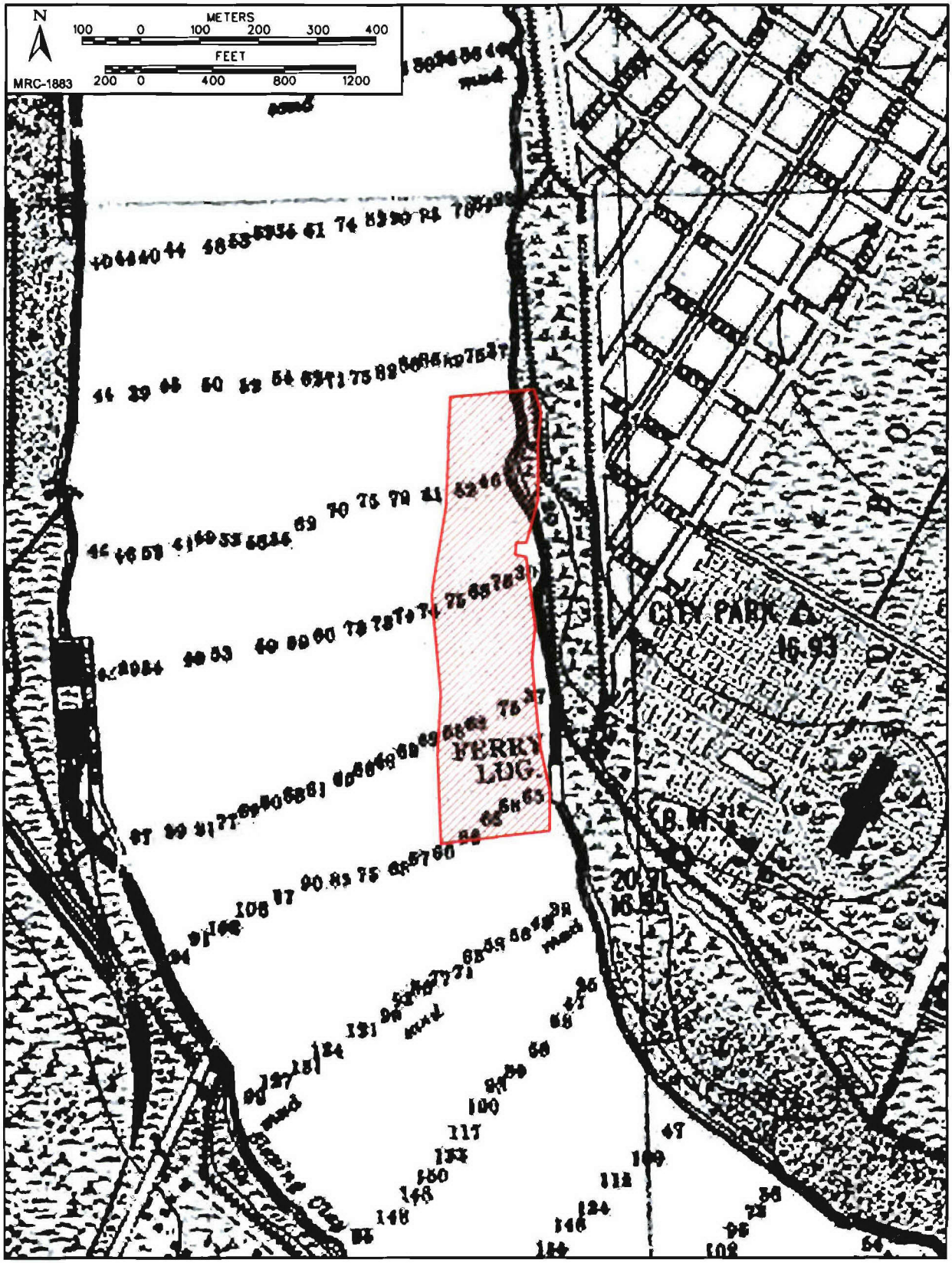


Figure 27. This Mississippi River Commission map was drawn from topographic information gathered in 1893-1894. Note that both the 1853 levee and the 1891 levee are in place along the riverside (excerpted from the Mississippi River Commission, *Survey of the Mississippi River, Chart No. 75*).

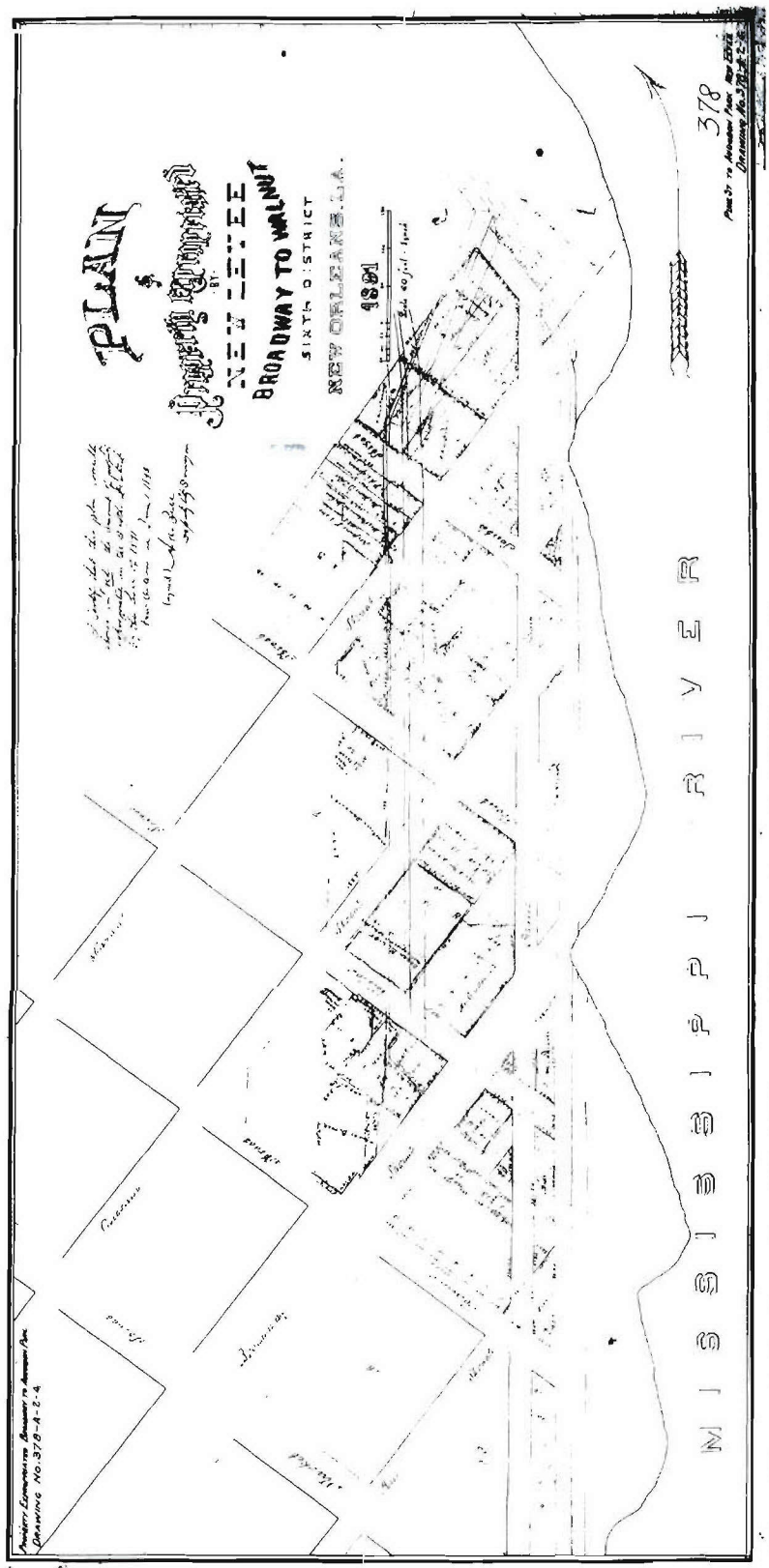


Figure 28. A close inspection of the 1891 expropriation map drawn by Bell illustrates the many commercial and residential businesses that were removed or destroyed in the vicinity of the project area in order to construct the new levee (excerpted from Bell 1891).

Map clearly shows both levees in place (Figure 27). In fact, in the published debates over the construction of the 1891 adjacent Carrollton levee, proponents of the project wanted to keep the old levee in place in order to give the new one time "to settle and solidify" (*New Orleans Daily Picayune*, September 19, 1891).

The levee setback in the project area (e.g. between Broadway Avenue and Audubon Park) resulted in the expropriation of all or part of 13 square blocks. It created a large, unused area of batture, uniquely protected on the riverside by the old levee. Joseph A. Bisso recognized commercial potential in this area, and managed to retain use and ownership of a small area of the batture. From this small spit of land, he built a maritime legacy along the batture, which will be discussed at length below. But the creation of the Walnut Street wharf had much more effect than just the creation of wealth for the Bisso family; it provided an anchor for a growing community, sandwiched between two developed areas of the city. Although the Greenville neighborhood was incorporated into New Orleans four years before Carrollton, residential growth in the immediate project area was accelerated upon the addition of Carrollton to New Orleans. The Carrollton neighborhood, which ran from Broadway Avenue to the Jefferson Parish line (Monticello Street), was incorporated into the city in 1874, and ease of access to the city via the New Orleans Railroad and Carrollton Railroad (now the St. Charles Streetcar line) made the project area a convenient residential community. The development of the wharf made the neighborhood a viable commercial area.

It seems likely that the steamboat landing wharf developed for the World's Industrial and Cotton Exposition in 1884 evolved into the Walnut Street wharf. The exposition landing, shown here (Figure 29), was located at the end of "Park Avenue," no longer extant. It would have been located just one block downriver from Walnut Street. Moreover, the 1893 Annual Report of the Chief of Engineers notes the construction of a new levee between "Broadway and Exposition Wharf" (United States Army Corps of Engineers, Annual Report of the Chief of Engineers 1893: 3822). Regardless of its origin, it is clear that the wharf area developed into the heart of the neighborhood. By the time the ferry to Westwego started in the early 1890s, the wharf was a landing place for steamboats and other riverboats, as well as ferries.

Although Louisiana state government took control of direction, maintenance, and operation of wharves in 1896 with the creation of the "Dock Board," some private wharf ownership endured in the city. The Walnut Street wharf, located on the riverfront property owned by Joseph Bisso, was certainly one of these private wharves. The period from Reconstruction through the turn of the twentieth century witnessed the concentration of mercantile "districts" in discrete sections of the city, as well as along certain riverfront areas. Hence, coffee, sugar, rice, grains, and cotton all had main wharves that catered specifically to those commodities (Campanella 2002:124). However, these areas were not exclusive, and while the majority of riverside commerce took place along the Canal Street wharves, some sales, loading, unloading and storage certainly took place at Walnut Street. This commerce also is confirmed by the fact that, in 1900, the neighborhood housed laborers who classified themselves as deck hands, grain weighers, longshoremen, boatmen, teamsters, cotton brokers, cotton agents, and steam boat agents (Twelfth Federal Census, Louisiana, Orleans Parish, Enumeration District 132, available online at www.ancestry.com) (Figures 30 and 31).

It is likely that at that time, the wharf was primarily a small wooden structure, which ran parallel to the river rather than the finger wharves that dominated the riverside throughout the nineteenth century. The 1883 Mississippi River Commission map, which, as stated above, includes landward topographic information dating to 1893, depicts the "ferry landing" in the area as a small structure running alongside the river, approximately 76.2 m (250 ft) long (Mississippi River Commission map 1883, Chart 65). One chronicler from around the turn of the century noted:

> The Walnut wharf was just two blocks long, but it was a busy funnel you could get into from Water [Street] or the important street, Magazine. From the edge of its eddies of men and wagons and barges and dollies and swaying ropes, you could see steamboats and, farther on, giant ships pushing high the

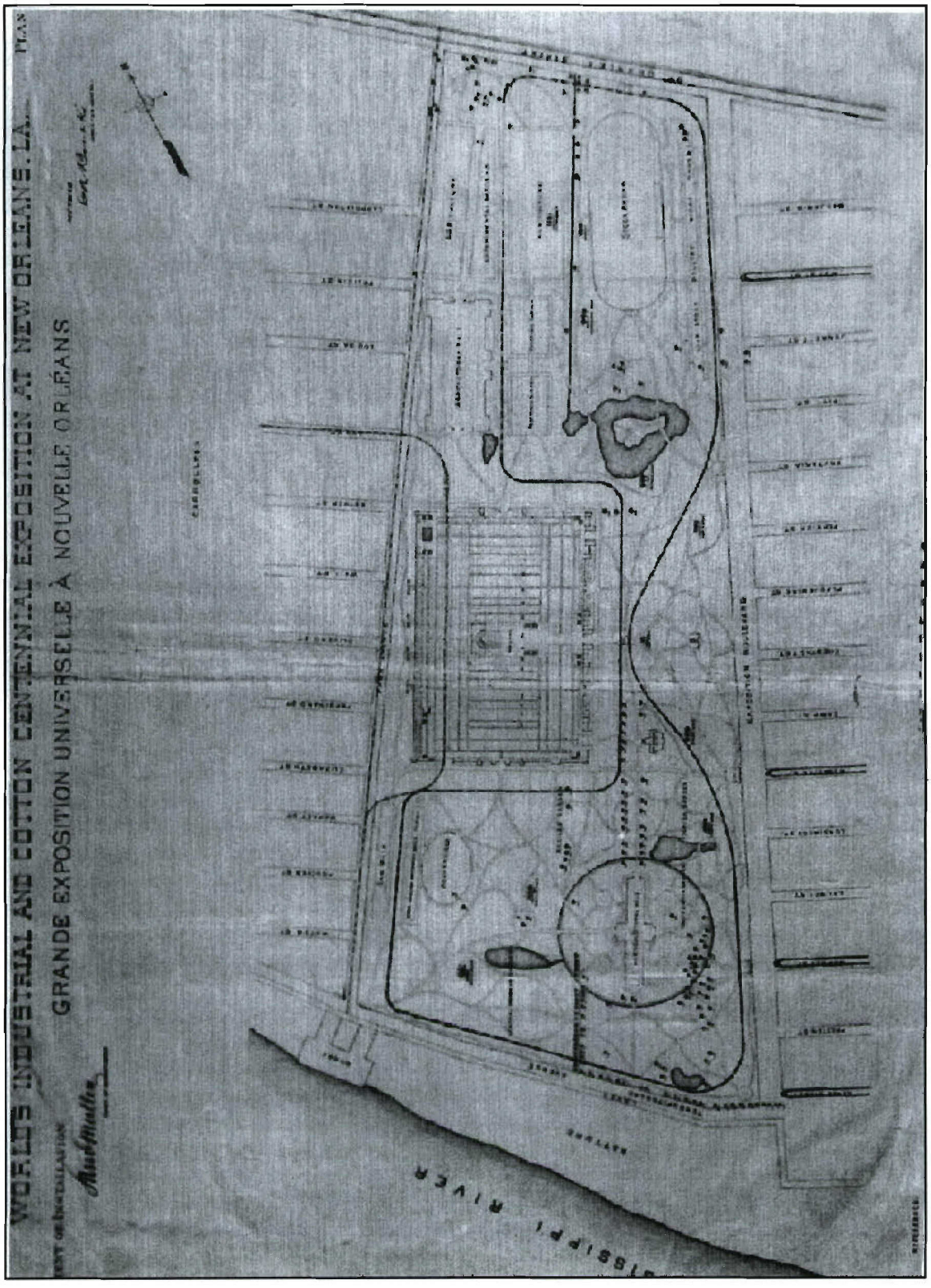


Figure 29. **This sketch of the World's Industrial and Cotton Exposition, ca. 1885, clearly shows a wharf on the river, in the vicinity of the current project area (excerpted from Cangelosi and Schlesinger, 1997).**



Figure 30. **The cotton wharf, depicted here ca. 1890s in a photograph from the George Francis Mungier collection, was located at the foot of Canal Street. Note that steamers and ailing ships loaded bales of cotton side-by-side well into the nineteenth century (excerpted from the Geroge Francis Mungier Photographic Collection, Orleans Parish Public Library, Louisiana Division).**



Figure 31. **This photograph, taken by William S. Howell on May 13, 1890, illustrates the activity along the New Orleans waterfront during sugar season. This photograph probably was taken in the vicinity of the foot of Customhouse (now Iberville) Street, where most sugar warehouses, sheds, refineries and offices were located (excerpted from William S. Howell Photograph Collection, Orleans Parish Public Library, Louisiana Division).**

> sky; crawling over them on mysterious errands were strange looking men....Darting in among moored ships and barges with a final bang at the barrier were the Bisso ferries, three on the run and still foot and wagon traffic lined up deep to cross over to Westwego (Goreau 1975:10).

During the early twentieth century, the Walnut Street wharf was a busy, small, private wharf, not unlike many others in the city.

One of the growing difficulties for commercial traffic at the turn of the twentieth century was the interaction of river traffic and rail traffic. The high tariffs charged by private railroads for moving goods to and from the riverfront caused local merchants to form the New Orleans Public Belt Railroad Association. The City Council authorized construction of the Public Belt Railway in 1900; its main track was laid in 1906. The railroad, located in many places between the levee and the road closest to the river, thus passed into public hands during the twentieth century, with management provided by the Public Belt Railroad; by the Orleans Parish Levee Board (OPLB), created in 1890; and by the Board of Commissioners of the Port of New Orleans (the "Dock Board"), formed in 1896. These public boards modified the entire riverfront area, constructing new levees, a public belt railway, new wharves, and new steel sheds along the river. The activities encouraged the economic development of the Port of New Orleans during the early twentieth century.

By the time the surveyors for the 1909 Sanborn Fire Insurance maps arrived in the project area, several buildings had been erected around the wharf. A boat repair shed (27.4 x 9.1 m [90 x 30 ft]), an engine shop (approximately 22.8 x 9.1 m [75 x 30 ft]), a tiny office (7.6 x 4.6 m [25 x 15 ft]) and several unidentified outbuildings were crowded around the ferry ramp (Figure 32).

Although a few dwellings were extant on the 1909 Sanborn Map, by the 1950s, map evidence notes the presence of a dozen additional structures on the riverside of the levee (Figure 33). These structures, noted to be "camps" on this 1937 Sanborn (updated through 1951), were wooden structures raised on stilts, and connected to the levee by wood plank walkways. According to William A. "Cappy" Bisso, III, these "batture dwellings" were rather impermanent buildings, on land owned by the Bisso family or the Bisso companies (Bisso, personal communication 2003).

Most interesting among the batture dwellings was a church, located just outside of the Carrollton Revetment (Figure 34). According to an article in the New Orleans States-Item, this was the aptly named Noah's Ark Baptist Church (*New Orleans States-Item*, October 27, 1948:12, column 2-5). The structure, which was identified as a church on the 1937 Sanborn Fire Insurance map, was also a one-story wooden structure, raised on piers to the height of the levee (Figure 35). A photograph from the same newspaper article shows that the church included a steeple. Conversations with William A. "Cappy" Bisso, III, suggested that no cemetery was associated with this church at that location (Bisso, personal communication 2003).

William A. Bisso, Jr., the father of "Cappy" Bisso, was a member of the Orleans Parish Levee Board in 1948, when the Board addressed the topic of batture dwellers. The OPLB considered the residents "squatters," who had built the houses themselves on land owned by others. Bisso, Jr., was one such owner. He noted that most of the residents on his property were African Americans, and that the houses themselves were "throw[n] up shacks and more elaborate cottages" (*New Orleans States-Item*, October 27, 1948:12, column 2-5). According to Bisso, the residents "work[ed] on the places at hours when our men [were] not on duty and when we [did] not find them" (*New Orleans States-Item*, October 27, 1948:12, column 2-5). By the 1970s, when his son, "Cappy" remembered the dwellings, the majority of residents in these quarters were employees of the New Orleans Coal and Bisso Towboat, Inc. (now Bisso Marine, Inc.), E. N. Bisso and Son, Inc., or Bisso Towboat, Inc (Bisso, personal communication 2003).

Even the Bisso family had a residence on the batture. Figure 36 shows the Bisso batture house. Along the side was a horse paddock and ring, still visible. "Cappy" Bisso remembers that the majority of houses were small, humble and rather dilapidated, and that the company tore them down one by one during the 1970s and

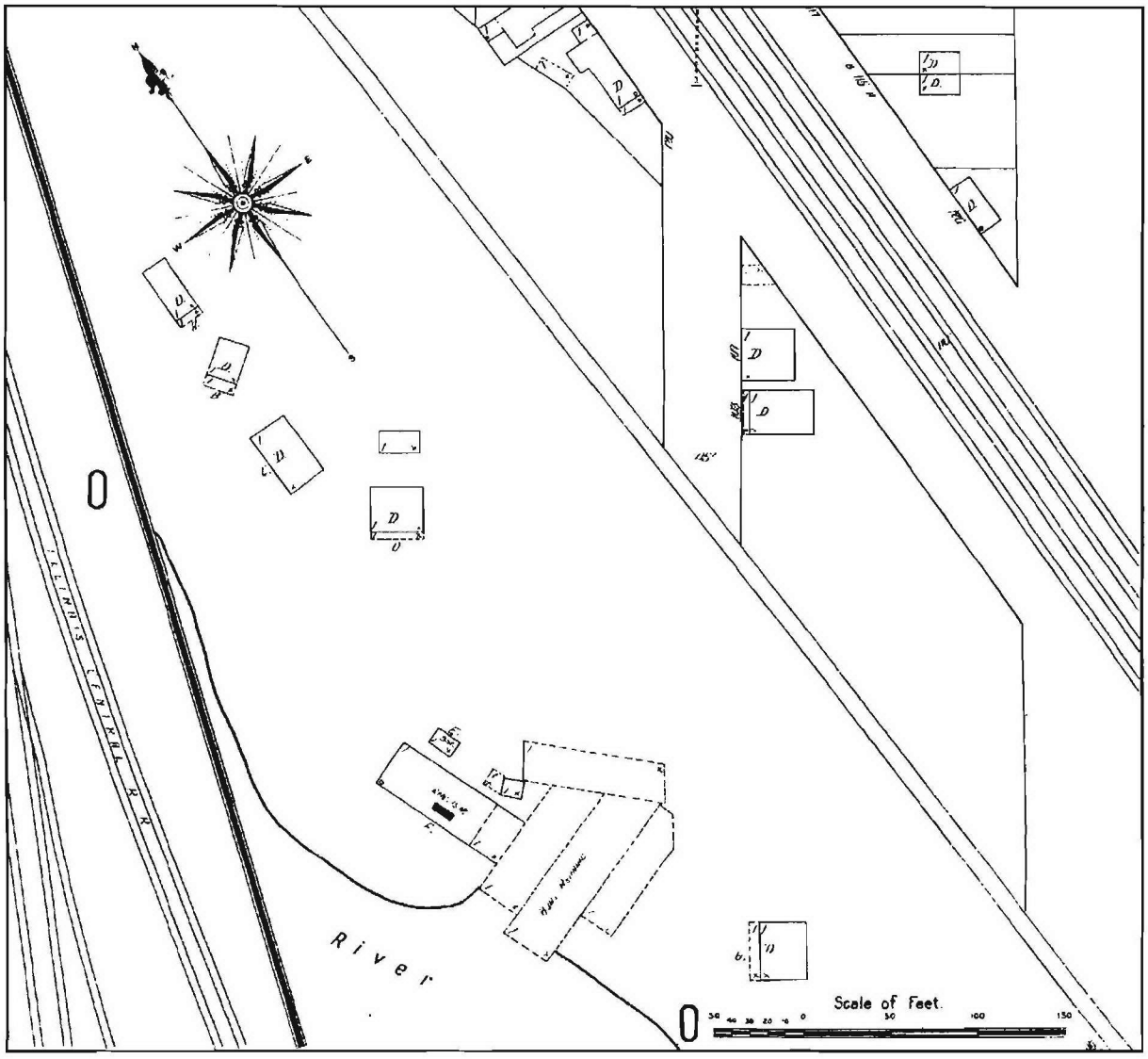


Figure 32. **The 1909 Sanborn Fire Insurance map of the project area depicts the ferry ramp and ancillary buildings associated with the wharf and ferry landing (excerpted from Sanborn Fire Insurance Company 1909).**

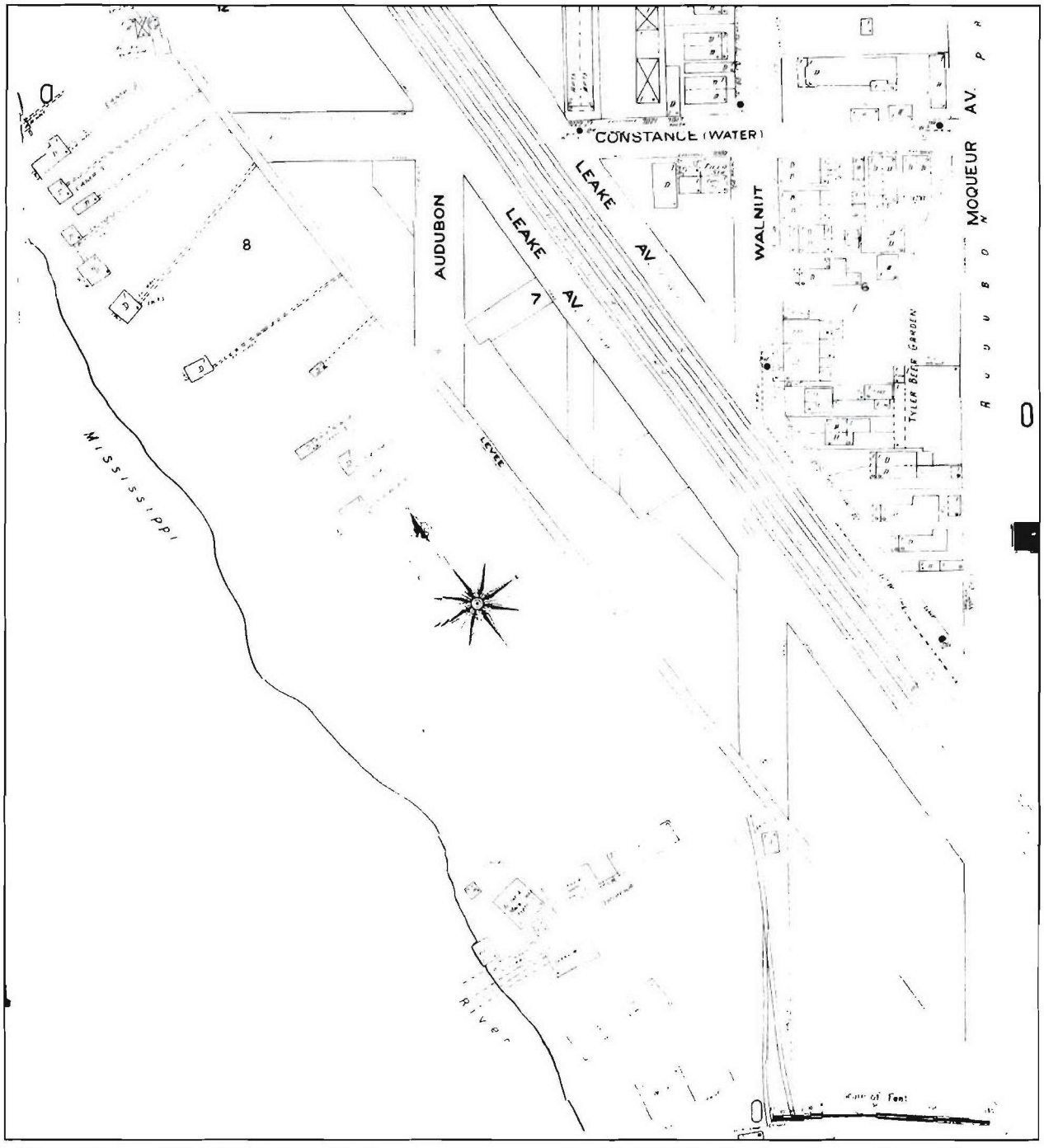


Figure 33. **This 1937 Sanborn Fire Insurance map was updated in 1951; by that time, dozens of riverside camps had been constructed just outside the Area of Potential Effect (excerpted from Sanborn Fire Insurance Company 1951).**

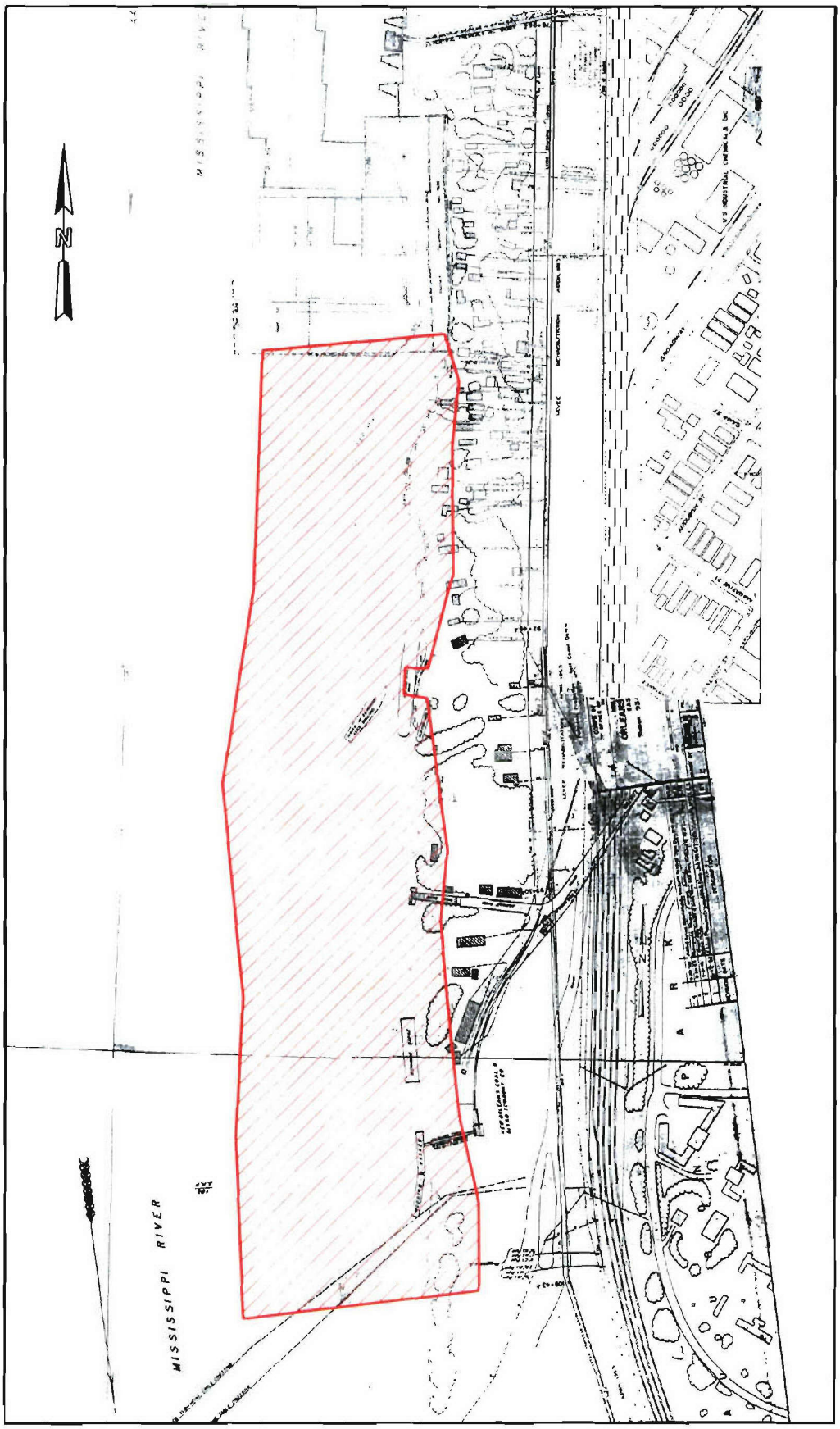


Figure 34. This United States Army Corps on Engineers map from ca. 1955 shows batture dwellings in the vicinity of the project area (United States Army Corps of Engineers, New Orleans District, map room).

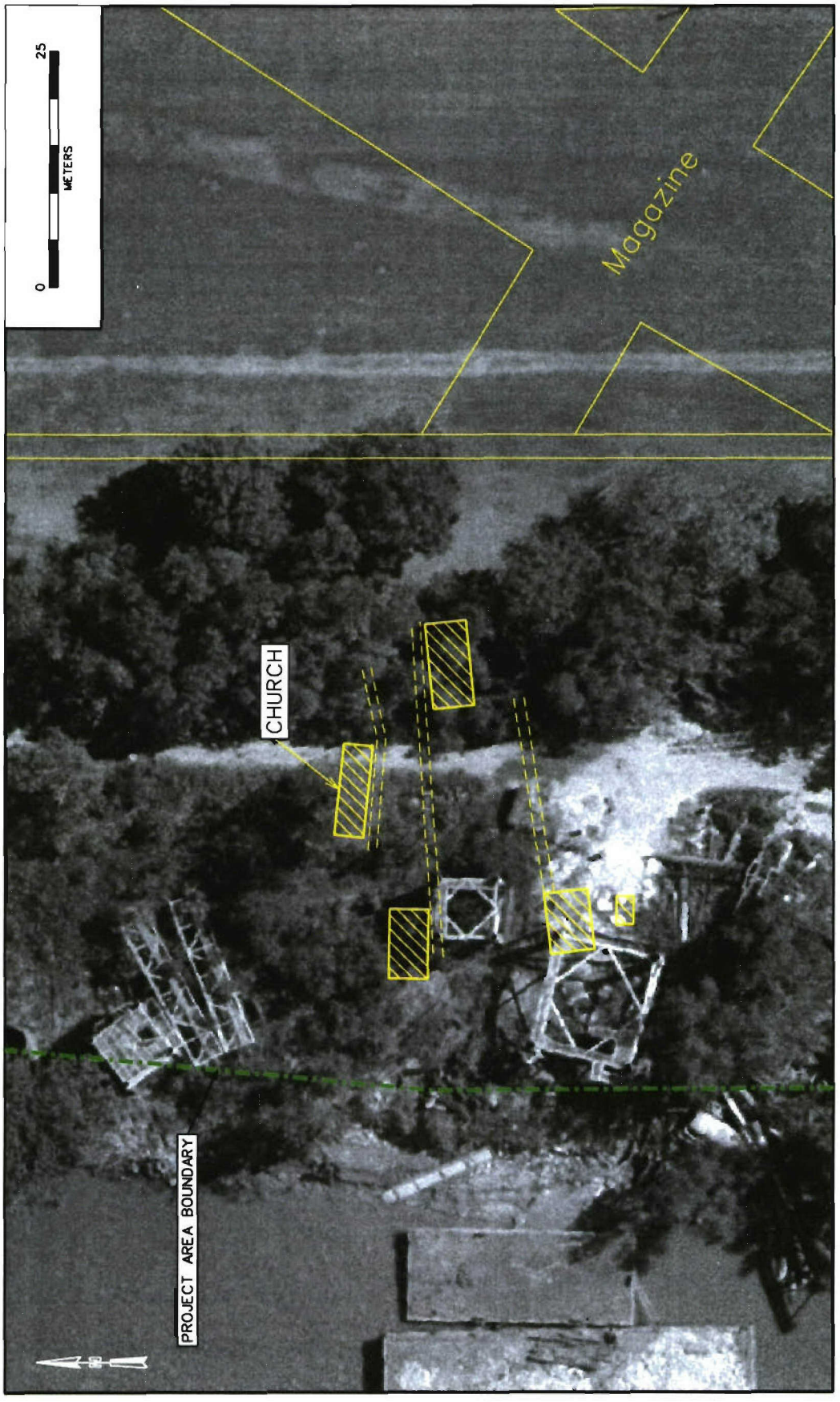


Figure 35. This overlay of the 1951 Sanborn Fire Insurance Map on a current aerial photograph depicts the location of the aptly-named Noah's Ark Baptist Church (excerpted from Sanborn Fire Insurance Company 1951 and ca. 1990s aerial photograph).



Figure 36. **For several years, the family of William A. Bisso, Jr. lived in this house on the batture (excerpted from Sanborn Fire Insurance Company 1951).**

1980s, as individual residents moved or died (William A. Bisso, III, personal communication 2003).

The Bisso Empire at the Foot of Walnut Street

The award of the Walnut Street-Gretna ferry to Joseph Bisso transformed the Walnut Street riverfront area from a small, private wharf to a substantive riverine commercial locus. The wharf and ferry also operated as the heart of the neighborhood, a place of employment for dozens of day laborers, and a transportation hub for both land and river. Beginning as a small, occasional ferry across the river, Bisso and his descendants transformed the riverfront area, and remained in the area for more than a century.

Joseph Bisso was born in Genoa, Italy during the 1840s. He came to America approximately ten years later, settling first in New Orleans with a family from the old country, the Damontes (William A. Bisso, III, personal communication 2003). After a short time in New Orleans, he traveled to Plaquemine to apprentice as a "blacksmith and horseshoer" (Fortier, ed. 1914:49). When the secession crisis came to a head, Louisiana seceded from the Union in 1861. Although numerous Confederate tacticians urged reinforcements of the Mississippi River and environs, Rebels failed to secure the river, and the Crescent City fell to the Federal forces in 1862. As a result of the Federal occupation, hundreds of young men joined the Federal forces in Louisiana; Joseph Bisso was among these recruits. Bisso joined the Union Navy, becoming a water tender on the U.S.S. Albatross. It is interesting to note that at least one historian has reported that Bisso fought for the Confederacy; however, Joseph Bisso recounted his service on the Albatross to his family, confirming his allegiance to the Union (William A. Bisso, III, personal communication 2003; Fortier, ed. 1914:49; Higgins, personal communication 2003).

After the end of the war, Joseph Bisso returned to New Orleans to restart his life. He married Mary B. Damonte in 1865, a daughter of the family who helped him when he immigrated. Mary owned property at the foot of Walnut Street, which she purchased from her father just after the war (Acts of George C. Preot, Notary Public, New Orleans, Louisiana, March 11, 1893). Over the next two decades, Mary and Joseph purchased several other lots in the Walnut Street area of Greenville, adjacent to the current project area. Joseph remained on the water, working for the Fischer Lumber Company in the Carrollton area. During the years just after the war, he ran log rafts down the Mississippi River, probably to the batture in front of the Fischer sawmill, which was the custom (William A. Bisso, III, personal communication 2003; Fortier, ed. 1914:49; Mahé 1976; Bell 1893). Fisher's Lumber Company, located along the river between Millaudon and Cherokee Streets (approximately six blocks upriver from the current Carrollton Revetment project area) included a large batture area, created by a levee setback and probably built after a crevasse (Figures 37 and 38). According to a short biography of Bisso, he worked for Fisher for approximately five years from 1886-1891, when he opened his own wood and lumber business (Fortier, ed. 1914:49). This date coincides with the year that the Fisher sawmill was destroyed by the construction of the Carrollton Bend new levee.

Joseph Bisso may have operated more than one business at a time. Although no listing for the name "Bisso" can be found in earlier city directories, by 1891, Joseph Bisso is listed in the Soard's New Orleans City Directory as a grocer at the "Walnut, north-west corner Levee" (Soard's City Directories 1891). Although this listing does not hint at a river business, several oral interviews indicate that around this time, Bisso began to run an independent ferry across the river from Walnut Street to the vicinity of the Company Canal, in Westwego. The ferry business may have begun around the time of the 1891 Ames Crevasse. On the evening of March 16, 1891, the river broke through the levee at the Ames plantation, directly across the river from Audubon Park and the project area. It flooded most of lower Jefferson Parish, inundating over 526,000 ha (1,300,000 ac), and causing upwards of $8,000,000 in damage (United State Army Corps of Engineers, Annual Report of the Chief of Engineers 1896:3685). Family lore indicates that Bisso began a hand-rowed ferry operation during this period, rowing local residents across the river to view the damage caused by the crevasse (Higgins, personal communication 2003) (Figure 39).

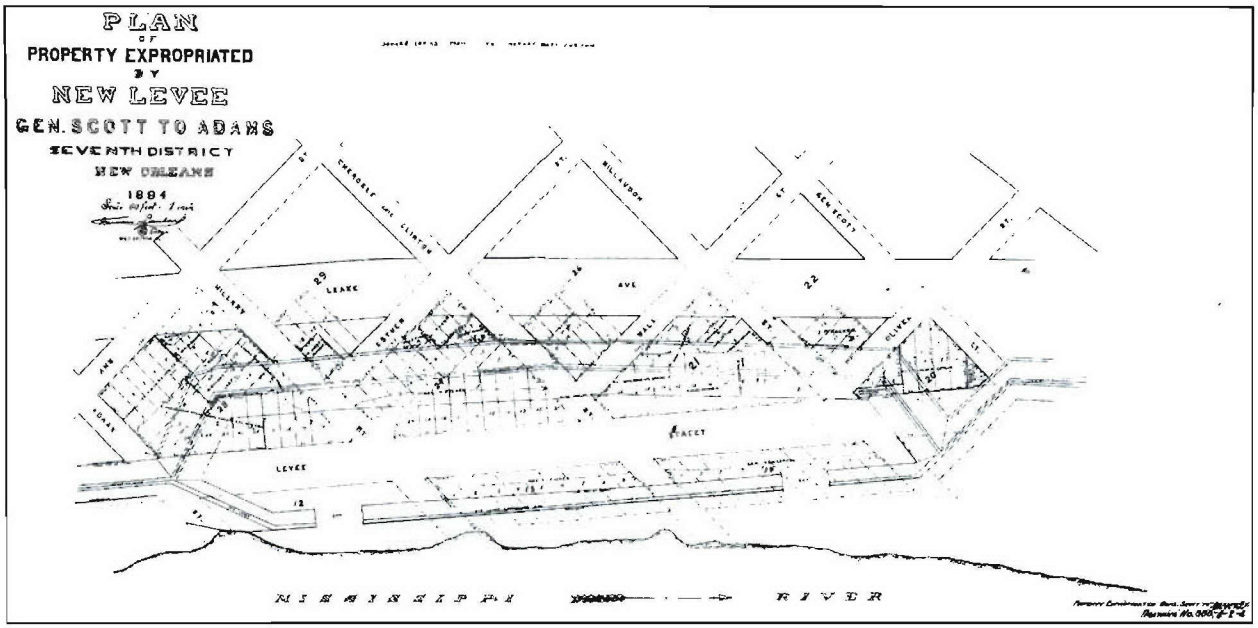


Figure 37. **This map of the land expropriated to build the new levee just upriver of the current project area illustrates the large batture area in the vicinity of the "Fisher" property. Prior to the new levee construction, the property was an ideal setting for landing large log rafts, floated downriver to the adjacent Fisher sawmill (Bell 1894).**

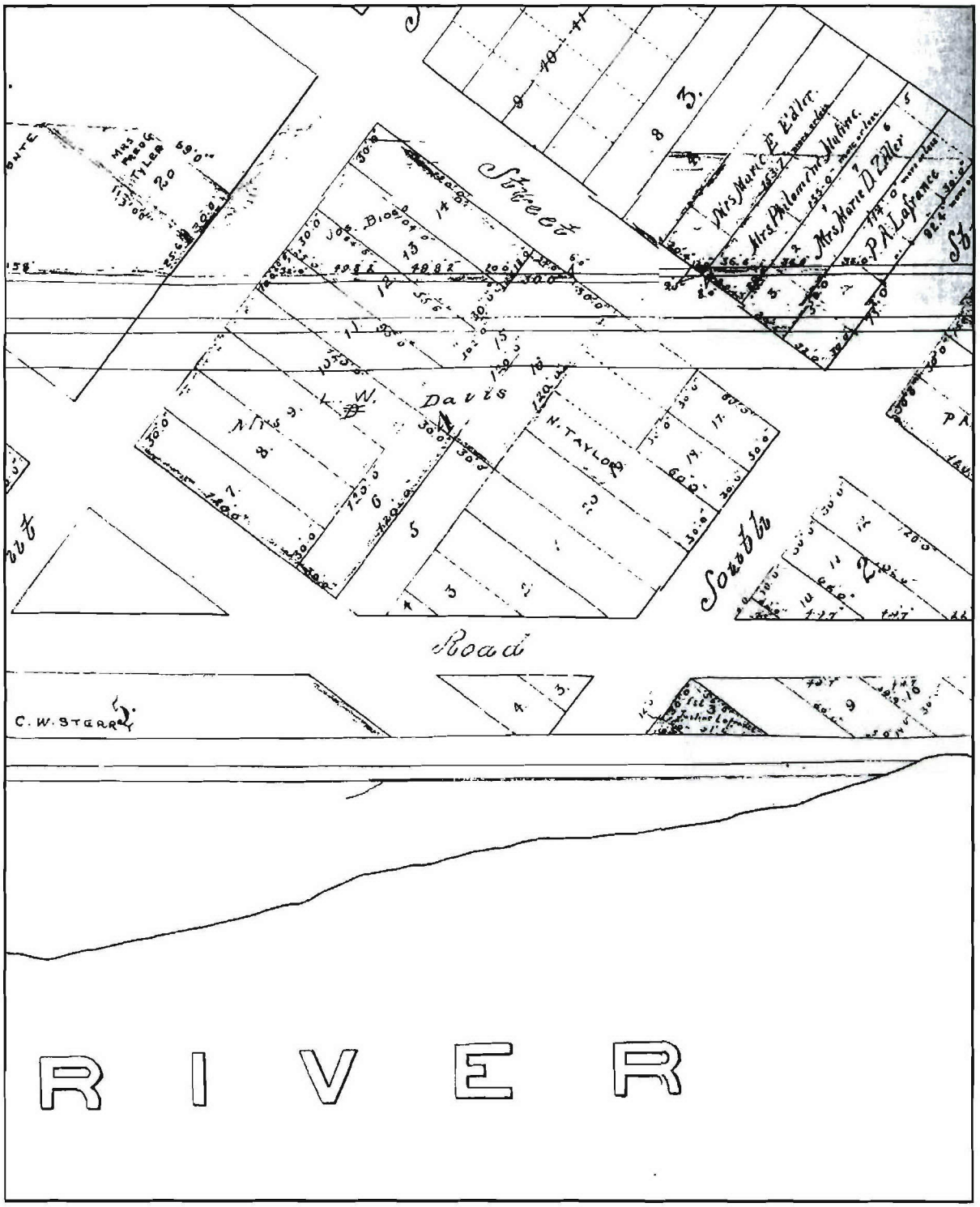


Figure 38. **Joseph Bisso and his wife, Mary Damonte Bisso, owned several properties in the area expropriated by the Orleans Parish Levee Board in 1891 (after Bell 1891).**



Figure 39. **The Mississippi River broke through the levee on the Ames Plantation, directly across the river from the project area, in 1890, causing the "Ames Crevasse." The break flooded most of lower Jefferson Parish, causing over $8 million in damage; however, it may have sparked the growth of a new ferry and wharf business at the foot of Walnut Street (excerpted from William S. Howell Photograph Collection, Orleans Parish Public Library, Louisiana Division).**

The Ames crevasse spurred additional action to protect the city from flooding. In 1891, the newly created Orleans Parish Levee Board expropriated several blocks of riverfront land along the project area for the purpose of building a new "Broadway to Walnut" levee. These expropriations of land changed the circumstances of the Bisso family. First, property owned by Mary and Joseph that was once removed from the waterfront by more than a block now abutted the levee; second, the levee board paid the Bissos $1,000 for additional lands they owned that were damaged during the construction of the new levee. However, unlike their neighbors, who sold their property outright to the Orleans Parish Levee Board, the Bissos retained their ownership to these lands, now located on the riverside of the levee. With property on both sides of the levee, ready access to the river, and capital from the damage settlement, it is likely that Joseph Bisso began his ferry service soon after the construction of the levee (Acts of George C. Preot, Notary Public, New Orleans, Louisiana, March 11, 1893; Bell 1893).

At least one other source points to the inauguration of the Walnut Street ferry during the early 1890s; the Mississippi River Commission map of the Crescent City taken from topography conducted in 1893-94 indicates a "ferry landing" in the project area (Figure 27). This landing may well have been adapted from the wharf located at the end of "Park Avenue," which formed the Uptown border of the Audubon Park, adjacent to Walnut Street (Figures 40 - 42). This ferry landing also was called Exposition Wharf on the levee expropriation documents, dated 1891.

A newspaper article from the same period documents the commercial nature of the area at the foot of Walnut Street. The article includes a rich description of the immediate neighborhood, just before the construction of the new levee and the institution of the new ferry, and, as such, is worth noting at length:

> The location is just above Audubon Park, and is a very busy place. Here are the moorings of the government repair fleet and Upperline ferry, and an extensive wood and coal yard adjoins. A small dock yard is also in operation, two iron tugboats having been already constructed. A large number of laborers, white and colored, who live in the immediate neighborhood, find constant employment in the different enterprises carried on here....The building of the Audubon Iron Works in the immediate neighborhood, and the possible construction of a belt railroad and ferry at that very point have given such an impetus to property in that locality that it is doubtful if a poor man can better himself by a removal (*New Orleans Times-Democrat* July 30, 1891:3, column 8).

It would seem that at least one ferry, from the project area to Upperline Street (Uptown) already existed at this spot by 1891. Moreover, it is likely that the "wood and coal yard" noted in the piece probably referred to the first riverine commercial venture undertaken by the Bisso family.

Another clue to the precise date of inception for the Walnut Street Ferry can be found in another newspaper article, dating from December 1892. This article noted that the City of Gretna and the City of New Orleans had "arranged for the franchise for the ferry from the intersection of the river and Magazine Street, at the Foucher Tract" (*New Orleans Times-Democrat* December 9, 1892:9, column 1). Hence, although the exact date when the first ferry carried passengers is not noted, it seems clear that Joseph Bisso began the riverine empire at the foot of Walnut Street no later than 1891, with the Westwego ferry beginning no later than early 1893.

The New Orleans City Archives, located in the Louisiana Division of the Orleans Parish Public Library, houses building plans for a "Westwego Ferry House" at Walnut and the River (Louisiana Division, Orleans Parish Public Library, Building Plans, MSS K5, March 30, 1896) (Figure 43). These date from 1896. By 1900, city directories listed Joseph Bisso as a river captain, and his son, William A. Bisso, as a pilot (Soard's City Directory 1900). That same year, this picture was taken "looking downriver from the Walnut Street Ferry" (Figures 44 and 45) (Louisiana Division, Orleans Parish Public Library, online photographic collection of Alexander Alison, available online at http://nutrias.org/photos/allison/theriver/river2.htm).

Joseph Bisso may have run several businesses at once during the early years of the twentieth century. He apparently maintained his

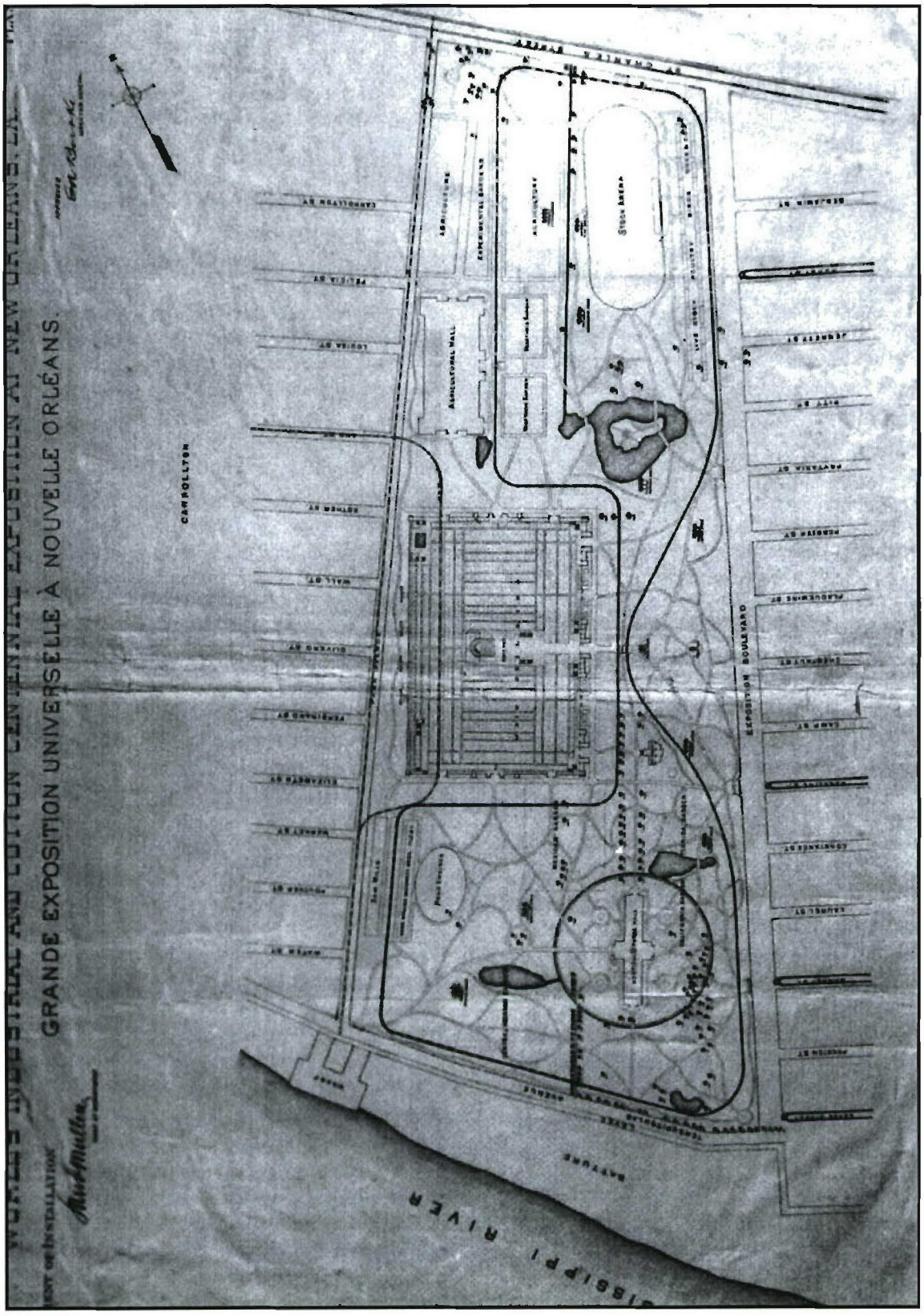


Figure 40. **[1884] This Site Plan from the World's Industrial and Cotton Centennial Exposition at New Orleans clearly depicts a wharf at the foot of "Park Avenue," adjacent to Walnut Street (excerpted from Cangelosi and Schlesinger 1997).**

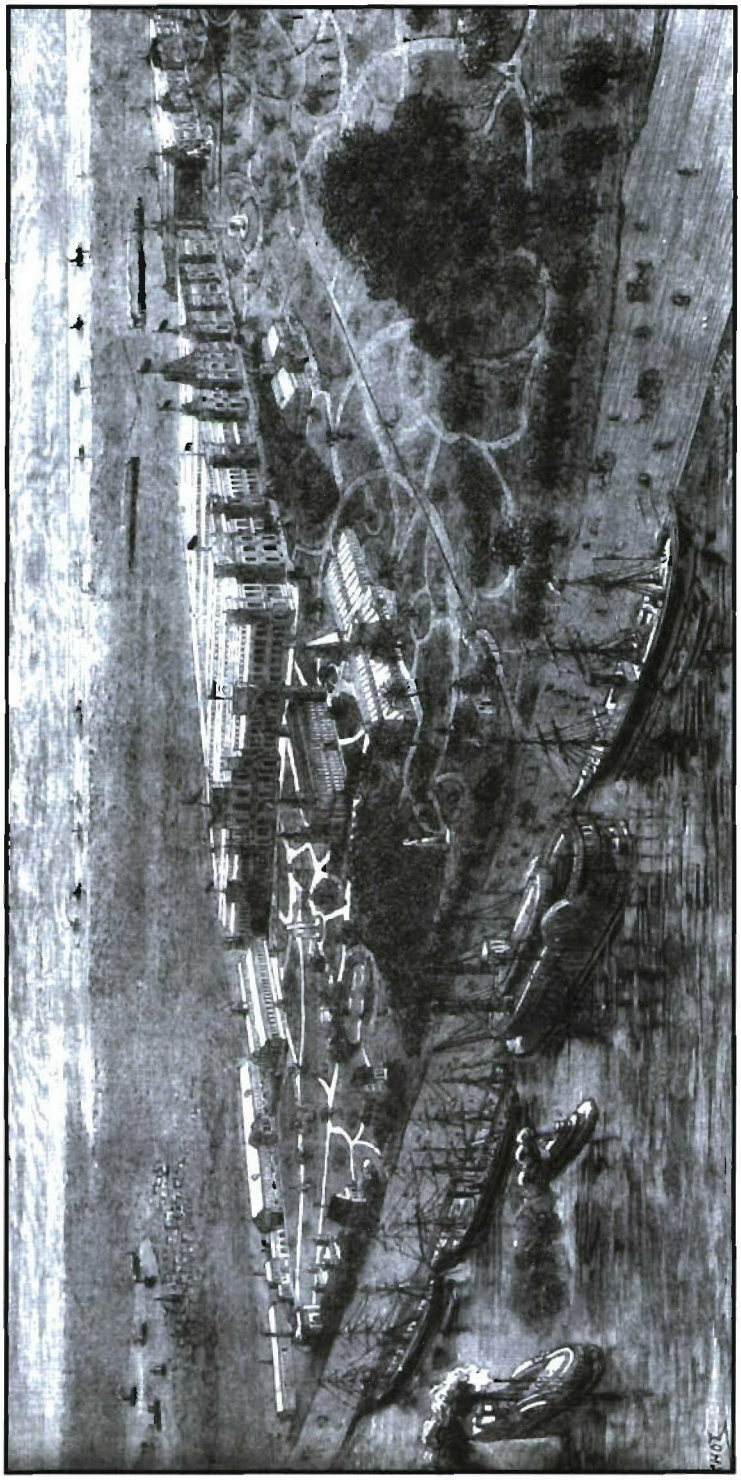


Figure 41. This C. H. Fichot painting depicts both steamboats and sailing vessels landing at the Cotton Exposition; in the background, dozens of other ships can be seen approaching the city (excerpted from Cangelosi and Schlesinger 1997).



Figure 42. This map, entitled *The World's Industrial And Cotton Centennial Exposition, New Orleans, La., U.S.A. Department of Installation. Plan No. 2 Map Of The City Of New Orleans Showing Location Of Exposition Grounds And All Approaches Thereto By Land & Water,* clearly depicts the steamboat landing wharf in the vicinity of the project area (excerpt from the David Rumsey Historic Map Collection).

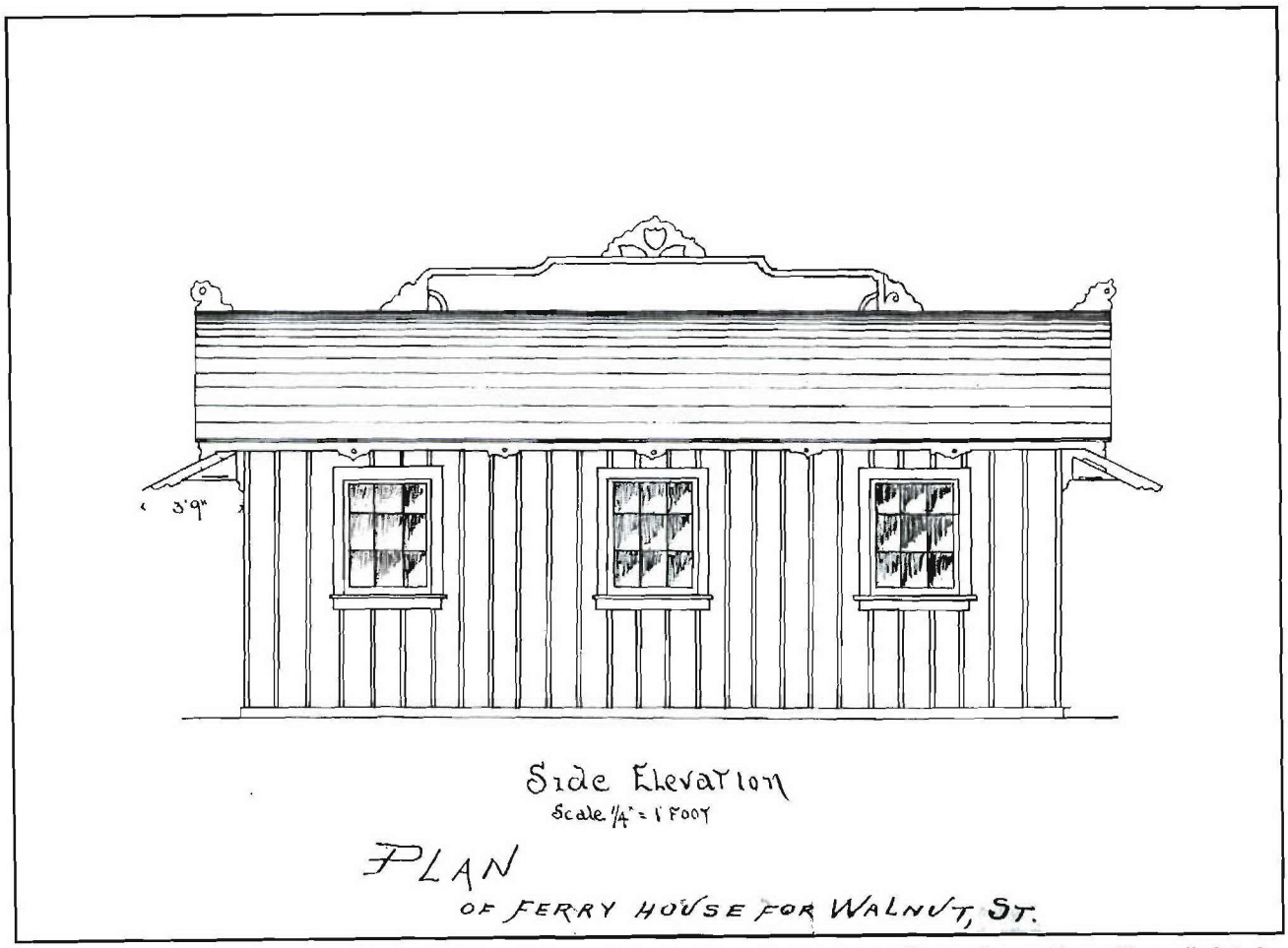


Figure 43. **This blueprint from the New Orleans City Archives depicts the "Walnut Street Ferry House," dated March 30, 1896 (courtesy of the Orleans Parish Public Library, Louisiana Division, Manuscript MSS K5).**



Figure 44. **This was the view downriver after disembarking from the Walnut Street Ferry in 1900. Note the wharf activity in the extreme right-hand edge of the photograph (excerpted from the Alexander Alison Photograph Collection, Orleans Parish Public Library, Louisiana Division).**



Figure 45. **This photograph, taken in 1897 by John Charles Olmstead, show the Walnut Street Ferry and Wharf, just upriver from the edge of Audubon Park (excerpted from Forman and Logdson 1985).**

grocery in the same location, at the foot of Walnut Street (Soard's City Directories 1906). Family members recall that his wife, Mary, may have run this venture; certainly she laid the plans to open a large market in the neutral ground of Broadway Street, although the project never came to fruition (Higgins, personal communication 2003; Figure 46). Bisso also was diversifying his riverine commerce to include towing services. In 1906, the city directory listed him as both the President of Bisso Tow Boat Company, and as a grocer (Soard's City Directory 1906).

If the heart of the neighborhood was the ferry, the heart of the Walnut Street riverine commerce was the coal depot. Throughout the early twentieth century, the New Orleans Coal and Bisso Towboat Company became the largest ship coaling and colliery business in the port. Dozens of men were needed to transfer coal from rail to warehouse, from warehouse to collier, and from the barge to awaiting ships. By this point, the area around the wharf had grown into a compartmentalized commercial district. The Bissos kept three ferries in continuous operation throughout the day, each running from Walnut Street across the river to Westwego (Goreau 1975:10). As the Bisso business grew to include towing and salvage operations, it also grew into a major employment center in the neighborhood.

It is clear that Joseph's sons, William A., Joseph A., and Alexander, all followed their father onto the water. Joseph A. Bisso was the Treasurer and Secretary of the Bisso Tow Boat Company as early as 1906. That same year, the youngest of the three sons, Alexander, was a river captain, although he was also a trained engineer (Twelfth United States Federal Census, 1900, Louisiana, Orleans Parish, Enumeration District 132, Sheet 34). William, the middle son, was a pilot from at least the age of 24 (Soard's City Directory 1900).

Joseph Bisso, patriarch of the river empire, died on Christmas day 1907. His three sons continued his riverfront business, operating the Walnut Street Ferry and towboats. Almost immediately, the Bisso brothers again diversified, opening the New Orleans Coal Company in 1908. The new company, headed by William Bisso, imported wholesale coal from the rich Alabama soft coal fields, for resale to rail and ship traffic (Fortier, ed. 1914:49). The coal was delivered by train along the Bisso spur of the Public Belt railroad to a storage area in the complex, just landward of Area B of the current project (Goreau 1975:25). The coal then was transferred to a collier or large coal hopper, and transferred by a conveyer to a barge on the river. Steamers stopped alongside the coaling barge to load fuel onto their vessels. A collier, steam railroad engine, and railroad tracks are still visible just outside the project area, remnants of this venture (Figure 47). By the 1920s, the brothers had distinct roles in the New Orleans Coal and Bisso Towboat Company—Joseph and William were co-presidents of the company, and Alexander worked as the Secretary and Treasurer (Soard's New Orleans City Directory 1926; Thirteenth and Fourteenth United States Federal Censes, 1910 and 1920, Louisiana, Orleans Parish, Enumeration District 221 and 242).

The First Schism and the formation of E.N. Bisso and Son, Inc.

According to family history, at some point during the 1920s the two eldest brothers purchased the interest in the New Orleans Coal and Bisso Towing Company held by Alexander. The two brothers then each took over different segments of the business; Joseph, by then known as "Bud," took control of the ferry operations, while William (Captain Billy) directed the operation of towboats and coal derricks. (William A. Bisso, III, personal communication 2003; Higgins, personal communication 2003). In 1921, Bud formed a separate company, the Bisso Ferry Company (Louisiana Secretary of State, Corporations Database, record of the Bisso Ferry Company, Inc.). By 1933, the Bisso Ferry Company ran the Jackson Street to Gretna Ferry, as well as the Louisiana Avenue ferry and the Walnut Street Ferry, in the currently proposed Carrollton Revetment project area. Captain Billy continued to run tugboats and river steamers, as well as selling coal on the river from his Walnut Street location. By the 1930s, his company was the "largest ship coaling and colliery business in the port" (From the "History of Bisso Towing Company" 2003, available online at www.bissotowboat.com). Both companies

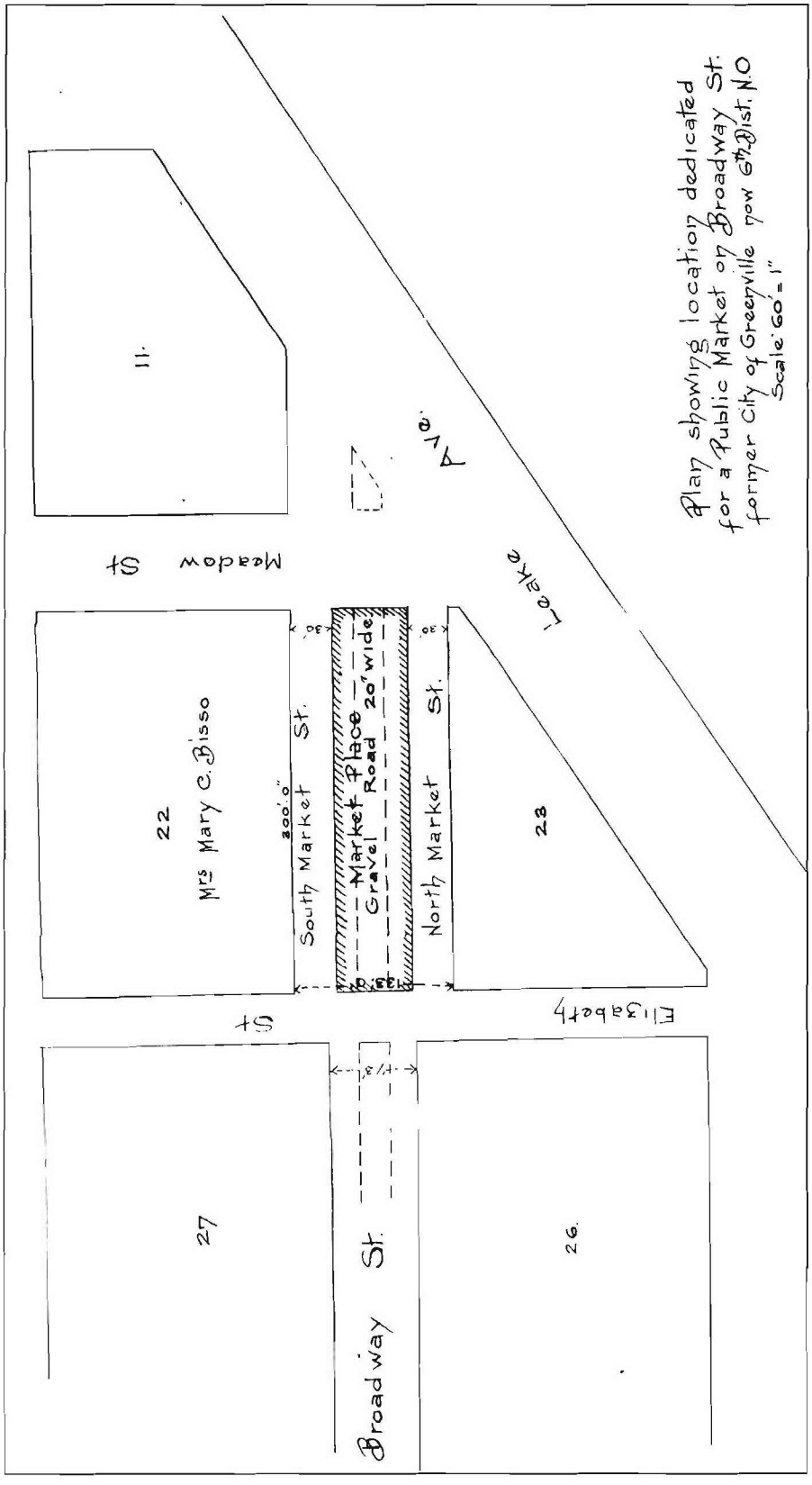


Figure 46. **At one time, Mary Damonte Bisso planned to build a grocery in the wide neutral ground of Broadway; however, for reasons unknown, the grocery was never constructed (courtesy of the personal collection of William A. "Cappy" Bisso).**



Figure 47. **This photograph illustrates the remnants of the coal chute and collier in the vicinity of the project area, as it exists today.**

emerged from the depression intact, and were poised for the economic recovery presented by the increased industrialization of the war effort.

However, a family disagreement erupted between the brothers. The cause of the disagreement does not survive, but the two companies became rivals. New Orleans Coal and Bisso Towboat Company bid on and won a ten-year ferry franchise at Napoleon Avenue, in direct competition to the Bisso Ferry Company. In retaliation, the Bisso Ferry Company purchased and began to operate tugboats, under the new name "Victory Towing Company" (Higgins, personal communication 2003).

After World War II ended, the third generation of Bissos took over the maritime operations. Joseph "Bud" Bisso had two sons, Edwin and Leo, who had been involved in the ferry business since they were young. The Victory Towing Company did not last long, but the tugs and ferries continued to operate, and the brothers diversified, offering the services of dockside linemen, and ancillary maritime services. The ferry segment of the business eventually splintered, forming several companies with the same members, including the Bisso Ferry Company, the Napoleon Ferry Co., and the Jackson-Gretna Ferry Company (*New Orleans Times-Picayune*, October 2, 1952:21, column 2). While Leo apparently became involved with several petroleum ventures, Edwin eventually formed his own maritime enterprise, E. N. Bisso and Son, Inc., which ran the Walnut Street Ferry, the Napoleon Avenue Ferry, and the Donaldsonville Ferry, as well as tugboats. It apparently superseded the Bisso Ferry Company. The ferries remained in operation until the Crescent City Connection bridge opened, linking downtown New Orleans with Algiers, Harvey, Gretna, and Marrero on the West Bank. The bridge made the majority of ferries in New Orleans obsolete, and today only three shuttles carry passengers across the river. When the ferry business became outmoded, E. N. Bisso and Son, Inc. shifted focus primarily to towing, barges, and derricks. Captain Edwin Bisso died in 1983, and passed the business on to his two sons-in-law, Archie Higgins, and C. D. "Jack" White. This company remains at the foot of Walnut Street to this day (Higgins, personal communication 2003).

The Final Split: The New Orleans Coal and Bisso Towboat, Inc. Divides into The Bisso Marine Company, Inc., and The Bisso Towboat Company, Inc.

When Joseph "Bud" Bisso formed the Bisso Ferry Company, his brother William "Captain Billy" Bisso managed the daily operations of the original company, the New Orleans Coal and Bisso Towboat Company. After the brothers' schism at the end of World War II, Captain Billy expanded the company to include deep sea towing, dredging, and derrick barges. Moreover, he modernized the fleet, converting from steam power to diesel. Although he ran the ferry at the foot of Napoleon Avenue for several years, his primary business focused on derricks and towboats. He died in 1963, at the age of 88, the sole owner of New Orleans Coal and Bisso Towboat Company.

His two children, William Bisso, Jr. and Cecelia Bisso Slatten, inherited equal portions of the company (Succession of William A. Bisso Sr., Civil District Court of New Orleans Docket 413-574, Division C, February 15, 1968). Upon his death, the siblings had the business appraised for its contemporary value, perhaps as a prelude to the equitable division of the business property. As soon as the estate of Captain Billy was settled in 1968, Cecelia Bisso Slatten and William A. Bisso, Jr. split the business; William A. Bisso, Jr. formed the Bisso Marine Company, Inc., specializing in marine construction, derricks, heavy lifting, and salvage, while Slatten formed the Bisso Towboat Company, Inc., focused on towing and the Napoleon Street Ferry franchise.

The companies remain divided in that same way to this day. William Bisso, Jr. ran Bisso Marine until his death in 1992. His son, William A. "Cappy" Bisso, III, took over, and now is retiring from the company, the fourth generation of Bisso sons to work at the foot of Walnut Street. His son, William A. "Beau" Bisso, IV, is taking the reins until William A. Bisso, V (born in the Summer of 2003) is ready to learn the business. The company now operates derricks, heavy lifts, wreck removal, marine salvage, and marine construction, throughout the Gulf of Mexico, and the Atlantic Ocean (Figure 48).

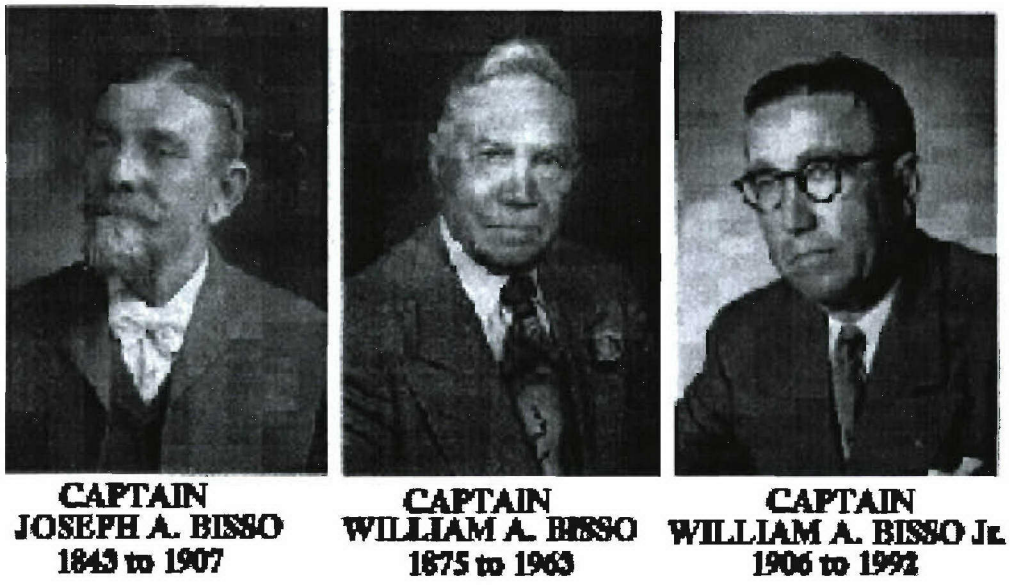


Figure 48. **Joseph Bisso, his son William A. Bisso, and grandson, William A. Bisso, Jr. lived and worked in the vicinity of the project area, building a substantial maritime commercial venture (excerpted from the website of Bisso Marine, Inc.).**

The Bisso Towboat Company, Inc. remains one of the largest marine tug and tow operations on the river. Although the Napoleon Street Ferry no longer operates, the company tripled the size of its towboat fleet during the 1970s. Bisso Towboat now operates 17 tugboats between the Gulf of Mexico and Baton Rouge. Their fleet is located in several places along the river, including New Orleans, Plaquemine, St. James, Myrtle Grove, St. Rose and Reserve, in order better to serve the extensive ports of South Louisiana. Captain Billy's grandson, William Bisso Slatten (who also goes by the name Captain Billy), now runs the company, with the help of his sons William, Jr. and Scott. They also are fourth- and fifth-generation river captains. Along with their cousins, they remain at the foot of Walnut Street.

Mahalia Jackson

One of the longshoremen who worked on the Bisso barges at the Walnut Street wharf around the turn of the century was Johnny Jackson. Jackson was the "straw boss," or crew chief among the wharf laborers, in charge of hiring and firing. His son, Johnny, Jr., worked alongside his father on the waterfront, and lived in the Walnut Street neighborhood. In 1911, the younger Johnny Jackson became involved with Charity Clark, another longtime resident in the area. On October 26th of the next year, Mahalia Jackson was born to the couple in a shotgun cottage on Water Street, between the levee and the railroad tracks (Goreau 1975:3-11; Schwerin 1992:21) (Figure 49). She would grow up to become the "world's greatest gospel singer," mesmerize the crowd at the famed Civil Rights march on Washington, and become the voice of the movement (Schwerin 1992:173).

Mahalia (born "Mahala") grew up in the shadow of the Walnut Street wharf. She played ball along the levee and collected stray coal that fell from the Public Belt railroad, on the way to the Bisso facilities. She remembered how "as a girl, it was nothing for me to go down by the levee on the waterfront and pick up wood that had drifted off the river onto the banks. I'd let it dry, and then carry it back on my head, for cooking and to keep us warm in the winter" (Schwerin 1992:21). The family was working class, as were most of their neighbors.

The neighborhood was rather typical of New Orleans at the dawn of the new century: mixed commercial development and residential housing, racially integrated, home to both wealthy and poor. Fewer than 1,900 individuals lived in the neighborhood between Audubon Park and Lowerline Street, St. Charles and the river (1900 Federal Census, Enumeration District 132). A glance through the census records reveals that the area was home to a small community of Italian immigrants, many of whom lived and worked alongside the river.

Most of the houses in the area were rental properties. Many had been moved from the riverside of the levee during the 1890s, and were in rough shape. Mahalia Jackson vividly remembered the "shotgun shacks" in her neighborhood:

> In those days, the houses were pretty shabby, and many of them are the same way today. The rent was no more than six or eight dollars a month, and things were pretty lean....You could be in the house, and you could see the sun outside, through the roof. If it rained, it rained inside. We'd rush about putting pots and pans around the floor to catch the run-off before we got flooded (quoted in Schwerin 1992:21).

The preponderance of male workers in the neighborhood worked as "day laborers." As was the case in all New Orleans neighborhoods, and around the "New South," these individuals did not have permanent employment, but rather worked odd jobs on a day-to-day basis. Typically, these men would gather on weekday mornings in commercial areas, where physical labor was needed. In the Greenville neighborhood, the Walnut Street wharf was the most active commercial area, bustling with ferries, steamboats, cargo, a dockyard, and lumber and coal activities. One account noted, "work for the men was mostly back labor on the busy Walnut St. wharf and its crowded ferries" (Goreau 1975:9).

The large crowds on the ferry certainly spoke to the need to connect Uptown New Orleans with the Harvey-Gretna area of the west bank. This need was exacerbated by the lack of a substantial road suited to vehicular traffic between Gretna and the lower portions of the west bank. For example, prior to 1911, there was no way to cross the Harvey Canal except via a

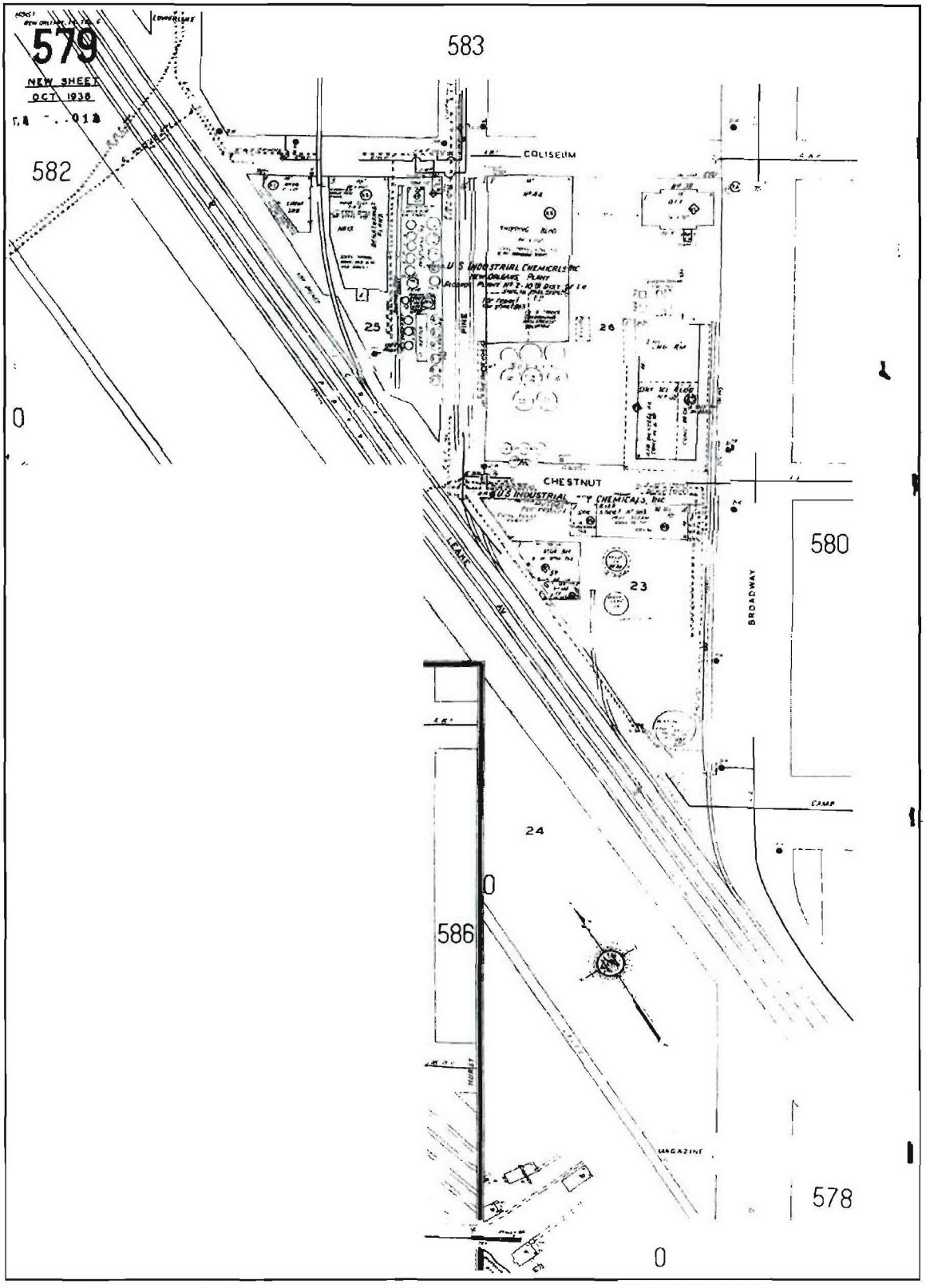


Figure 49. **The 1909 Sanborn depicts the three houses that remain on Water Street between the levee and the railroad tracks. Mahalia Jackson was born in one of these houses (Sanborn Fire Insurance Maps, New Orleans, 1909, Volume VI, p. 578).**

small crosswalk over the locks at River Road. Gretna and Harvey were both burgeoning towns at the time, separated by the canal. Consequently, residents of Gretna who needed to conduct business in Harvey were forced to cross the river on the Gretna ferry, travel up Tchoupitoulas Street to Louisiana Avenue, where they boarded the Harvey ferry to recross the Mississippi. Harvey residents simply reversed the process (Thoede 1976:31).

Like Harvey and Gretna, the Walnut Street neighborhood was itself a burgeoning commercial area. In addition to the waterfront ventures, the neighborhood supported several groceries and a bakery. The Bisso family owned the grocery on the corner of Magazine and Walnut Streets. It was a combination restaurant and barroom, a common configuration in New Orleans. The grocery store fronted Magazine Street, while the bar was in the rear, accessible either from a door on Walnut Street or by walking through the store. The grocery across the street, on the uptown corner of Magazine and Walnut, was run by Rudolph Jung and his wife, Gladys (Goreau 1975:10; 1920 Federal Census, New Orleans, Louisiana, Enumeration District 246, Sheet 14B). Magazine Street was unpaved, but, unlike the nearby side streets, it did have sidewalks. The commercial ventures, nearby park, and the paved sidewalks made the area a prime location for snowball stands, rolling drink carts and fruit stands. Mahalia Jackson recalled how exciting her childhood neighborhood was on weekends, saying:

> Fridays and Saturdays, payday, the very banquettes—the sidewalks, you know—child, they jumped! Magazine had the only sidewalks around paved smooth with cement. And that street came alive with the gamblers! On their knees they'd be, shaking those dice, or throwing those cards: Pitty-pat...seven could play that; Cotch...seven could play that too; Georgia Skin...that was like what you call it? Blackjack....I was little, but I saw it all (Goreau 1975:10-11).

Mahalia said there was song everywhere in the Walnut Street neighborhood: singing dice chants, work songs from the wharf, the street vendors crying their wares, Baptist and Spiritualist shouts from nearby churches, even ragtime bands playing a new type of music called "jass" or "jazz" along Magazine Street and in Audubon Park.

But God-fearing Baptists, like Mahalia and her family, did not play cards, and did not listen to "low down" music. Both her father and grandfather were Baptist ministers, and her whole, large, extended family was devout Baptists. She first sang in public at the age of four, when the Plymouth Rock Baptist Church on Hillary Street featured her in their children's choir (Goreau 1975:13). When her maternal grandfather, Reverend Paul Clark, took the position as minister at the Mount Moriah Baptist Church, on Millaudon Street, the family changed churches. Mount Moriah became Mahalia's new "church home," and a major influence on her life.

The following year, her mother, Charity Clark, died suddenly at the age of thirty. Mahalia went to live with her namesake, Aunt Mahala Paul, known to the family as "Duke." Aunt Duke moved the family a few blocks away, to General Scott Street, still just one block from the river. The neighborhood was known as "Pinching Town," a play on the nickname for wealthier "Pension Town," an area of black landowners close to Carrollton. In "Pinching Town," residents rented their houses, worked when they could, and squeezed every drop out of a penny (Goreau 1975:15).

Aunt Duke raised Mahalia and her brother, Peter, in a strict environment. As soon as she moved in with her new family, Mahalia began to do chores after work. By the time she was in fourth grade, family duties called her away from school; she dropped out to raise her niece and nephew. She took in laundry, raised the children, and cleaned the house every day. Attending church at Mount Moriah was a relief from the drudgery of work. She joined the youth choir, led by Fletcher "Oozie" Robinson, attended Sunday school, and became a member of the Baptist Training Union. On Saturday nights, the church showed movies for $.15 (Goreau 1975:27).

In and around the Walnut Street neighborhood, "Halie" learned about the inequality faced by African Americans in the South. Racial segregation in New Orleans after World War I was on the rise. Streetcars, bars, restaurants, swimming pools, and even parks were divided along a color line that was, at times, difficult for a casual

observer to discern. Mahalia worked at the Audubon Park Natatorium (swimming pool) one summer, never permitted to enter the cool, blue water. Even the child's carousel in Audubon Park was reserved "strictly for whites" (Goreau 1975:36) (Figure 50). Jackson resolved to be the first black child in New Orleans to ride the flying horses. One day, when her aunt was at work, she borrowed one of Aunt Duke's white maid uniforms, and a basket to carry over her arm. She walked over to Adams Street to pick up a friend, "a light-skin child," much younger than her. The two walked over to the carousel, with her friends hiding in the woods nearby, watching the ruse. "Nursemaid" and charge paid one fare (because maids did not have to pay), climbed up on the largest moving horse they could find, and rode the carousel. When the ride ended, they dismounted, and casually walked into the woods, where her friends awaited to toast her victory. Halie proclaimed, "Some day you *all* going to do it; but you remember now, I'm the *first colored person* rode the flying horses" (Goreau 1975:37).

By the time she was fifteen, Mahalia spent most of her free time at church, and she became increasingly concerned about her own salvation. For a Baptist, salvation comes both from a personal decision to accept the faith, and an offer of membership from the church community. Hence, it is at once personal and public. The Mount Moriah Youth Choir held a revival during the Spring of 1927, nineteen young Baptists searching for rebirth. Mahalia prayed for her vision, for her Gospel song, to feel the power of conversion. She found it in the words of classic Gospel minister Dr. Isaac Watts, "Jesus, my God, I know His name/I wonder where is He/Go down and search among the flowers/Perhaps you'll find Him there" (Goreau 1975:45). She felt she was ready for her baptism in the waters of the Mighty Mississippi.

But Aunt Duke was not convinced of the truth of Mahalia's vision. She withheld her approval, and the other members of the church choir were baptized together, while Mahalia sat apart, still not saved. Finally, a group of stewards from Mount Moriah visited Duke and interceded on behalf of Halie. Her aunt relented, and in the Fall of 1927, Mahalia Jackson marched down to the Mississippi River at the foot of Magazine Street, in the shadow of the Walnut Street Wharf, along with the entire congregations of the Mount Moriah and the Broadway Missionary Baptist Churches. Her father, a minister at Broadway Missionary, and E. D. Lawrence, the Pastor at Mount Moriah, led the group on the short walk, singing "Let us go down to Jordan" (Goreau 1975:46). Mahalia Jackson later said that, "ever since that day, I promised the Lord that I'd dedicate my life to Him in song" (Ebony Magazine 1972).

In the small Carrollton and Greenville communities, the young singer had already earned a reputation for her voice, but after her conversion, her reputation spread. She began to receive calls to perform at uptown churches, including the Mt. Triumph Baptist Church on Fern Street, by Willow (Goreau 1975:47). But her fame in New Orleans would be short-lived; her Aunt Hannah visited from Chicago at Thanksgiving, and invited Halie to return with her to the north. Anxious to escape the growing racism and lack of opportunity in New Orleans, Mahalia accepted.

In Chicago, Jackson's Gospel career accelerated. She became a member of the Johnson Singers, on the South Side of the city, and her reputation began to grow. She gained fame around the city, and began to travel with tent revivals around the South. However, it was her association with noted author and documentarian, Studs Terkel that finally propelled Jackson to national fame. In the wake of World War II, Terkel hosted Jackson on his Chicago radio program, "The Wax Museum." Bess Berman, the New York owner of Apollo Records, signed Jackson to a recording contract, along with dozens of notable African American blues singers, including Dinah Washington. She lived up to Terkel's assertion that she sang "like the great blues singer, Bessie Smith," and even non-Gospel audiences listened to her music (Schwerin 1992:64). For generations of white Americans in the postwar era, Mahalia Jackson became the voice of Gospel music

Jackson also played a key national role in the Civil Rights Movement. She became involved with Dr. Martin Luther King, Jr., Dr. Ralph Abernathy, and Dr. Fred Shuttlesworth in the protests against southern segregation. She was the only featured soloist at the Prayer Pil-

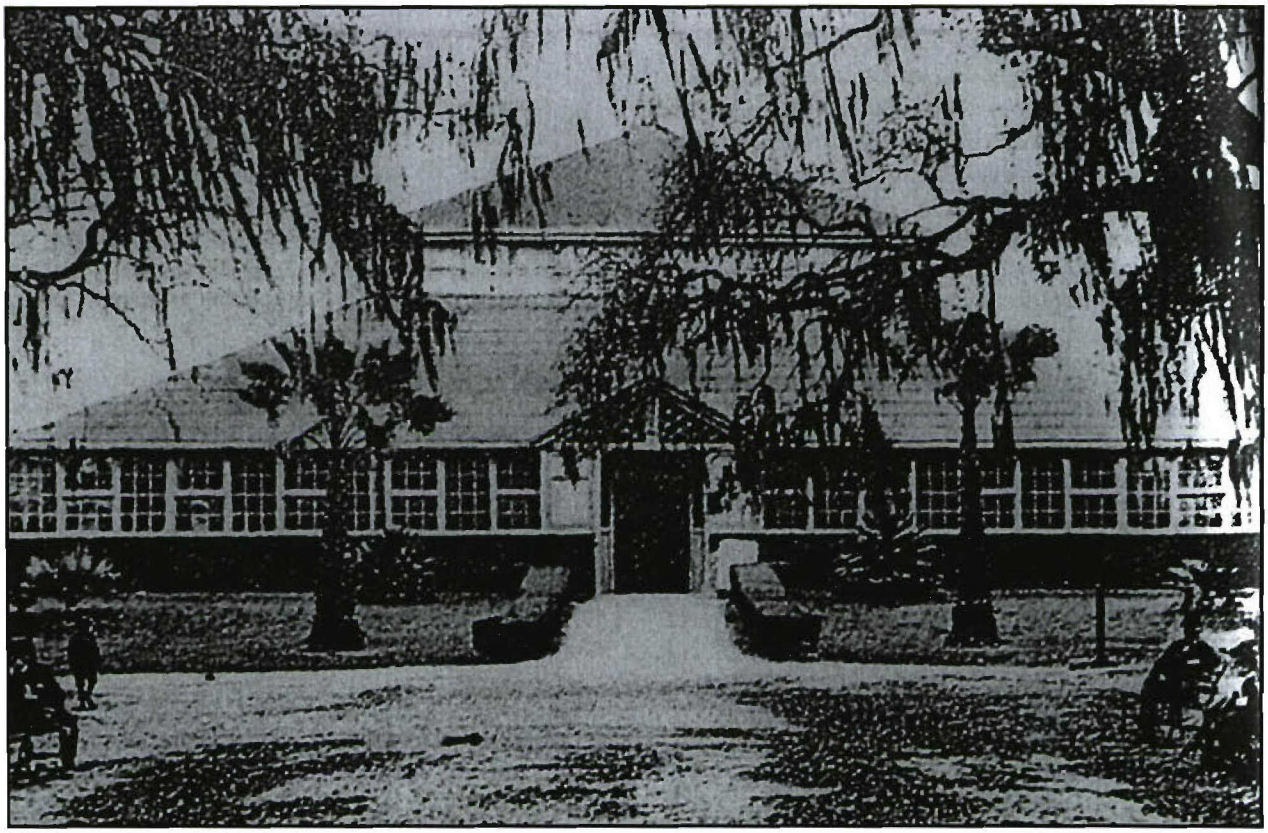


Figure 50. **The Audubon Park Carousel was segregated when Mahalia Jackson was growing up in the neighborhood (excerpted from Cangelosi and Schlesinger 1997).**

grimage for Freedom in Washington, D.C. in May of 1957—the first "march on Washington" (Figure 51). She sang for kings and queens, for popes and presidents around the world. At the inauguration of John F. Kennedy in 1961, Mahalia sang "The Star Spangled Banner." But when she sang "How I Got Over" for a sea of people on the Mall in Washington, August 28, 1963, she made history. Dr. King reportedly asked specifically for the song, just as she approached the podium. The lyrics fit the moment, and set the tone for the extraordinary speech King gave that day:

> How I got over,
> How I got over, my Lord
> And my soul looked back and wondered
> How I got over, my Lord
>
> The tallest tree in Paradise
> The Christians call it tree of life
> And my soul looked back and wondered
> How I got over, my Lord
>
> Lord, I've been 'buked and I've been scorned
> And I've been talked 'bout as sure as you're born
> And my soul looked back and wondered
> How I got over, my Lord
>
> Oh, Jordan's river is so chilly and cold
> It will chill your body but not your soul
> And my soul looked back and wondered
> How I got over, my Lord

As she sang, the sea of people on the Mall swayed with her, and one journalist noted, "the button-down men in front and the old women in back came to their feet screaming and shouting....[f]rom different places and different ways, with different dreams they had come, and now, hearing this sung, they were one" (Lerone Bennet, quoted in Saunders, ed., 1963:12).

Following her piece, Dr. King arose to speak. Bob Zellner, a field secretary for the Student Nonviolent Coordinating Committee, witnessed the moment from just below the speakers' stand. He was surprised to hear Mahalia say to Dr. King, "tell them about the dream, Martin" (Zellner, online interview, available at http://www.crmvet.org/info/zellner1.htm). Although King was known as an extemporaneous speaker, historians disagree on whether her invective changed the tone and tenor of one of the truly momentous speeches in American history. Regardless, King heeded Jackson's words, telling America of his dream for the future:

> I have a dream that one day this nation will rise up and live out the true meaning of its creed: "We hold these truths to be self-evident, that all men are created equal."
>
> I have a dream that one day on the red hills of Georgia the sons of former slaves and the sons of former slave owners will be able to sit down together at the table of brotherhood.
>
> I have a dream that one day even the state of Mississippi, a state sweltering with the heat of injustice, sweltering with the heat of oppression, will be transformed into an oasis of freedom and justice.
>
> I have a dream that my four little children will one day live in a nation where they will not be judged by the color of their skin but by the content of their character.
>
> I have a dream today.

The March on Washington remains one of the turning points of the twentieth century. President John F. Kennedy met with King, Abernathy, A. Philip Randolph, Bayard Rustin and other Civil Rights leaders later in the day, to pledge his support for the passage of the Civil Rights Act. Just three months later, on November 22, 1963, Kennedy was assassinated in Dallas, Texas. His Vice President, Lyndon B. Johnson, signed the Civil Rights Act into law the next year. With its passage, the United States began to dismantle the system of racial discrimination in voter registration, residential housing, job availability, and school segregation.

The changes wrought by the Civil Rights Act of 1964 prompted a violent response nationwide. Dr. King was assassinated less than five years later, on April 4, 1968, on the balcony of a Memphis, Tennessee hotel. Mahalia Jackson, who had followed him for years, providing the voice for the movement, sang at the nationally televised funeral.

For the next four years, Mahalia continued to travel the world, actively working for Civil Rights for all Americans, and to spread the gospel of Gospel music. She was on the Board of Directors of Dr. King's organization, the Southern Christian Leadership Conference. She toured Europe several times, and performed on dozens



Figure 51. **Mahalia Jackson was the only woman on the podium at the first March on Washington, in May 1957 (photograph courtesy of the Library of Congress).**

of television variety shows. On January 27, 1972, her ill health and frantic touring schedule finally caught up with her. Mahalia Jackson died from complications following abdominal surgery in Chicago, Illinois (Goreau 1975:609).

So many individuals were affected by the death of Mahalia Jackson, two different funerals were held in two separate cities. In Chicago, where she lived her adult life, and where she died, 40,000 mourners waited in a bitter January wind to pay final respects to the legend, including Mayor Richard Daley, Reverend Jesse Jackson, and the widow of Martin Luther King, Jr., Coretta Scott King. Aretha Franklin sang "Precious Lord, Take My Hand," the same song Mahalia had sung for the funeral of Dr. King. The next week, at the large, New Orleans Rivergate Convention Center Auditorium, Mayor Moon Landrieu, Governor John J. McKeithen, and 60,000 others attended her wake, held over three days. Dozens of international leaders sent their condolences, including President Richard Nixon, who called her "a noble woman, an artist without peer, a magnetic ambassador of goodwill for the United States in other lands, an exemplary servant of her God" (Nixon 1972). Harry Belafonte captured her role in the Civil Rights Movement in this way: "She was the single most powerful black woman in the United States, the woman-power for the grass roots. There was not a single field-hand, a single black worker, a single black intellectual who did not respond to her Civil Rights message" (Schwerin 1992:183).

As her long funeral cortege left the Rivergate, on the way to the Providence Memorial Park in Metairie, Louisiana, it drove along the river road, between the levee and the shotgun houses that made up Mahalia's childhood neighborhood. It drove slowly past Mount Moriah Baptist Church on Millaudon Street, where Mahalia first joined the youth choir, and where she found God and Gospel music (Figure 52). Mourners gathered there along the street, to bid a final farewell to the "world's greatest Gospel singer."

Years earlier, Jackson remembered the funerals she used to attend at Mt. Moriah, and the music that followed the ceremony,

> If anyone in the community would die, who was well-loved...they would always hire a band....if it was a man that died. If it was a woman? They didn't usually do it for us....And when the body would come out of the church, the drums would hit up sad songs like 'Nearer my God to Thee,' or 'What a Friend We Have in Jesus,' and they would march behind the hearse with the coffin, all the way back to the Green Street Cemetery....After the burial, the band would strike up these religious songs, and the people from all over the city would meet at the cemetery and return, dancing in the streets to 'When the Saints Go Marching In'—that's what that one's all about...People were always happy then, even though they knew someone had died. But that music did mean something to them (Schwerin 1992:25-26).

Mahalia was well loved. Several bands played for her funeral in New Orleans. On the way back from Providence Memorial Park, those bands undoubtedly struck up "When the Saints Go Marching In." Mahalia herself would have approved; after all, as she noted in her autobiography, "the Scripture says: 'Rejoice at the outgoing'" (Jackson, with Evan McLeod Wylie, 1966).

History of New Orleans' Audubon Park

In 1871, when the New Orleans Park Commission acquired the land that now is known as Audubon Park, the nineteenth century park movement was just beginning to gain momentum in the United States. The Audubon Park location had been an unprofitable plantation on the edge of a swamp. Previously owned by Pierre Foucher and his wife Francois de Boré, the property lay about six miles upriver from the center of the old city, in an area that had just been incorporated into the New Orleans city limits. Consisting of approximately 400 acres, it included a smaller, more famous plantation once owned by Jean Étienne de Boré. As noted above, de Boré was the first mayor of the city after the United States purchased the Louisiana territory and is commonly credited with being the first person in the country to successfully granulate sugar commercially. Other than sugar for the de-



Figure 52. **Mahalia Jackson's funeral cortege slowly passed Mt. Moriah, where Jackson had been baptized (Ebony Magazine 1972).**

Boré experiments, no agriculture of any consequence existed on the properties, and both the Foucher and de Boré plantations were considered failures (Forman and Logsdon 1985:85; Galloway 1977:9-10).

Upon his death in 1834, Pierre left the land to his son Louis, who eventually deserted it and moved to France. During the Civil War, the abandoned plantation was used as a military encampment first by Confederate, and then Union armies, which probably destroyed whatever plantation buildings remained. After the war, the Foucher heirs reclaimed the property (Forman and Logsdon 1985:85-86; Galloway 1977:10).

Two resourceful speculators, Robert Bloomer and Malek A. Southworth, the recorder of mortgages for Orleans Parish, offered the heirs of Foucher six hundred thousand dollars in 1871 for the property. They intended to build a city park, and a new state capitol on the abandoned land. In a convoluted scheme, the two businessmen convinced the Reconstruction government to put up most of the money for the land purchase, promising individual state legislators choice lots on St. Charles Avenue for their own use. The New Orleans Park Commission promptly was created. Southworth, as one of its members, sought to sell the property to a state board of which he was a member. The scheme helped lead to a change of government as well as to the impeachment of Governor Warmoth (Forman and Logsdon 1985:86-88; Galloway 1977:10-11).

Following this scandal, the newly elected government abolished the Park Commission in 1877, and for nearly a decade, "Upper City Park," as the area was called, lay fallow awaiting regular municipal appropriations (Forman and Logsdon 1985:88; Galloway 1977:14). The only noted activity on the property resulted when, in 1881, the New Orleans Pacific Railway Company obtained a 99-year lease to build wharves, tracks, and other depot facilities on the batture areas of the park. However, the lease was revoked just three years later, and the batture apparently remained untouched (Forman and Logsdon 1985:88; Galloway 1977:15-16, 99; Mississippi River Commission, 1883, Chart 76).

The World's Industrial and Cotton Centennial Exposition

During the early 1880s, to celebrate the 100th anniversary of the first shipment of cotton from the United States in 1784, local businessmen and three streetcar lines campaigned to host a world's fair in Upper City Park. The planners hoped that the fair would spark long-term residential and recreational development in the uptown "suburban area." In order to facilitate the exposition, the New Orleans City Council offered the park without charge to the promoters (Figure 53) (Forman and Logsdon 1985:88-90; Galloway 1977:17).

On December 16, 1884, the Cotton Exposition opened to much fanfare, but with few completed exhibits and little landscaping, leaving most of the land raw and undeveloped. The principal structures included the twenty-eight-acre Main Building, one of the largest exhibition halls ever built, the Government Building, an Art Gallery, the Factory and Mills Building, and Horticulture Hall. Constructed of wood and glass, Horticulture Hall, which sat between Magazine Street and the river and which housed various forms of tropical and semi-tropical plant life, would remain a central attraction to the park until 1915 when it was destroyed by a hurricane (Forman and Logsdon 1985:92; Galloway 1977:20-21).

The fair area was promoted as one that was easily accessible by rail and boat, although no wharf existed on the overgrown batture until just one month before the fair opened, and a single railroad track entered the park only from the west. The wharf was intended to be temporary. An 1884 plan of the "World's Industrial and Cotton Centennial Expo at New Orleans" depicts a wharf at the foot of "Park Avenue," adjacent to Walnut Street (Figure 40) (Cangelosi et al. 1997:42; Forman and Logsdon 1985:90, 93; Galloway 1977:17).

When the Cotton Exposition failed after six months, another company, the North, Central and South American Expo, attempted to operate the fair, but it also failed after only a few weeks. With the exception of Horticulture Hall, most of the buildings and exhibitions were dismantled



Figure 53. **The World's Industrial and Cotton Centennial Exposition in 1884-85 set the stage for the development of Audubon Park (excerpted from Forman and Logsdon 1985).**

and auctioned to the highest bidders. Despite its failure, the Exposition focused attention on the park as a recreational park for New Orleans, and stimulated uptown residential development (Forman and Logsdon 1985:22, 102).

Audubon Park

After the North, Central and South American Expo folded, a new Park Commission was created in May 1886. The area was renamed Audubon Park in honor of John James Audubon, the well-known painter of Louisiana birds and nature, who was mistakenly taken to be a native of the state. The remnants of the fair included a wharf, a livestock arena, Mexican barracks, a large chunk of iron ore from the Alabama exhibit (often mistakenly thought to be a meteorite that landed in the park), and Horticulture Hall. These structures were used to raise money for park improvements. The Commission leased the wharf, sold hay from the park meadows, and rented space for a racetrack. Fifty acres between the river and Magazine Street were leased for ten years to the Louisiana Science and Agricultural Association for a sugar experimentation station. Contrary to popular belief, the station was not located on the location of the original de Boré plantation (Forman and Logsdon 1985:104; Galloway 1977: 24-25).

By 1889, Audubon had begun to resemble a park. Visitors toured Horticulture Hall and watched harness races on Sunday afternoons, while residents of the area used the open fields for baseball and tennis games. However, with vital municipal services still lacking in most areas, the city paid little attention to recreational needs, leaving civic leaders to assume much of the responsibility for the expansion and maintenance of the park (Galloway 1977:26, 29-30).

When a real estate boom occurred in the St. Charles Avenue neighborhood during the 1890s, Audubon Park quickly became surrounded with homes, churches and schools, including the university campuses of Tulane and Loyola, and the exclusive gated community of Audubon Place. In 1896, the city began appropriating $15,000 annually for park maintenance. Horticulture Hall was renovated, and pedestrian and bicycle paths along the riverfront were put into place (Forman and Logsdon 1985:105, 108; Galloway 1977: 36, 42).

In 1898, John Charles Olmsted, the nephew of the noted designer Frederick Law Olmstead, who planned Central Park in New York, was awarded a design contract for Audubon based on a $1,000,000 dollar development plan. Olmsted, whose firm would continue to advise Audubon Park until World War II, envisioned a traditional public park to, "provide city dwellers with a convenient opportunity to enjoy beautiful nature scenery and occasional relief from the nervous strain caused by the excessive artificiality of city life" (Forman and Logsdon 1985:4). He planned strolling paths, elaborate landscaping and lakes for rowing, while discouraging monuments, museums, baseball diamonds and swimming pools (Figure 54). Nevertheless, New Orleans people quickly brought twentieth century popular sports and recreational activities to Audubon, making it, "part park, part playground" (Forman and Logsdon 1985: 4, 7, 110, 112, 122, 125; Galloway 1977:43).

That same year, the U.S. Army Corps of Engineers obtained control of the riverfront batture for its wharves and equipment for a five-year term. Simultaneously, the Illinois Central railroad was awarded permission to build tracks along a new, higher levee. Both of these developments effectively blocked the Olmsted plan for a riverfront promenade, and separated the river from the park. Additionally, the lease for the sugar experimentation station was extended, and one third of the park, previously the location of the Main Building from the world's fair, was turned over to the newly formed Audubon Golf Club (Forman and Logsdon 1985:115, 117; Galloway 1977:29).

By the end of 1901, the portions of Audubon Park that were accessible to the general public had been cut in half; only the space between Tchoupitoulas and Magazine Streets remained viable recreation areas (Forman and Logsdon 1985:115, 117; Galloway 1977:29). Just ten years later, the park area between Magazine Street and the river was the primary park location, used for picnics, ball games, concerts, motion pictures and rowing. However, a lack of money prevented the development of the area according to the Olmsted plan. In the fall of 1909, a tornado swept through the park damaging numerous trees and demolishing the better part of Horticulture Hall. In 1915, a hurricane

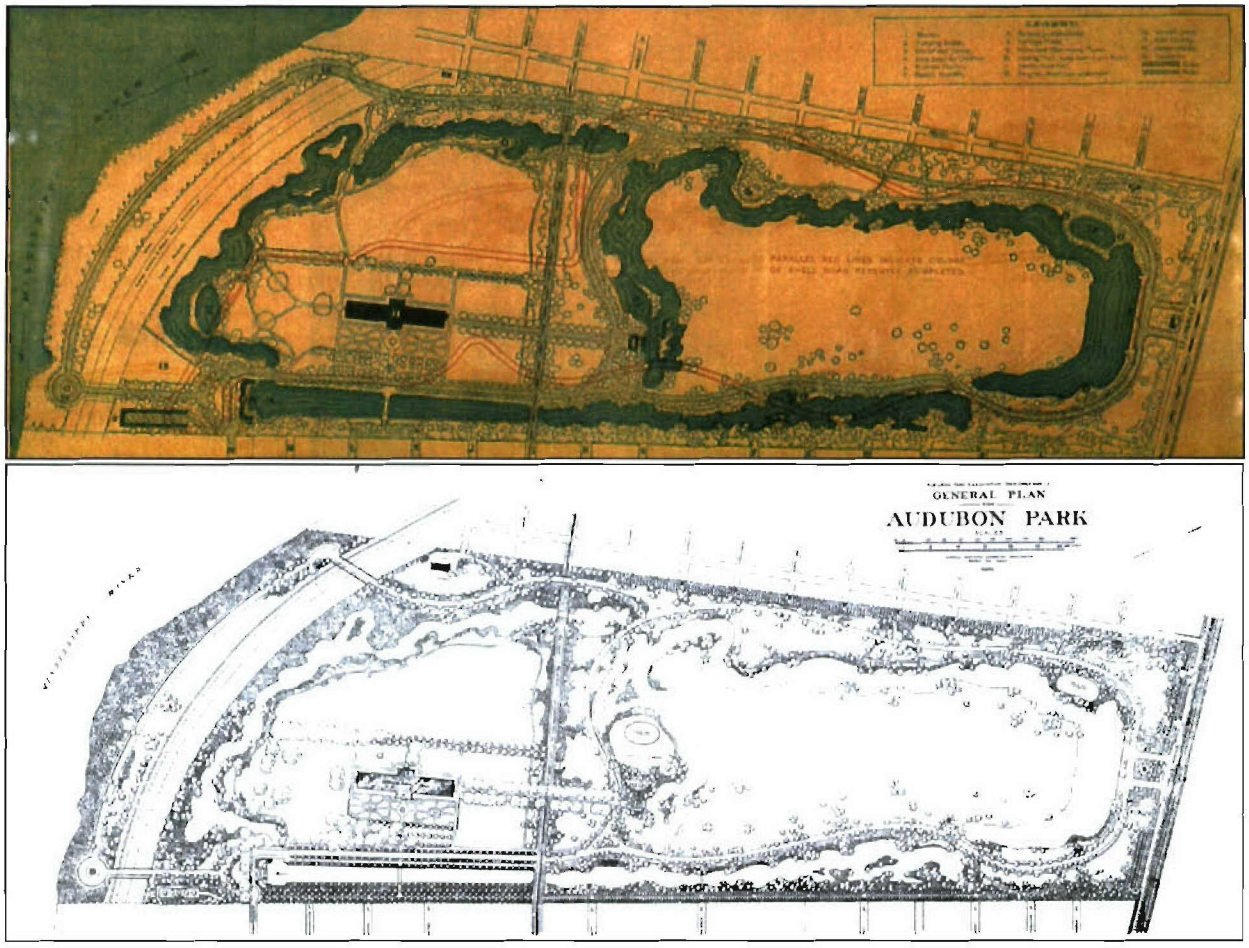


Figure 54. **John Charles Olmstead's original design for Audubon Park included large, open spaces (excerpted from Forman and Logsdon 1985).**

finished off the building, and it was completely removed (Galloway 1977:58, 61).

Audubon Park received a large appropriation from the city in 1914. George Washington Lake, at the rear of the park, was lengthened by connecting it with the borrow pits along the levee and the lake was stocked with trout, ducks and rowboats. Three baseball diamonds, a basketball court and six tennis courts were built, and, in 1918, a wildlife exhibit was created showcasing birds and wild animals native to Louisiana (Galloway 1977: 66, 70-71).

Between 1919 and 1929, Audubon Park developed rapidly. Increased sports facilities, the expansion of the wildlife exhibit into a zoo, and the construction of a swimming pool were among the executed improvements. The formal St. Charles Avenue entrance also was built, and the roadway encircling the ancient oak trees remaining from the eighteenth-century Foucher plantation was paved. However, the plan to pave a road that crossed the levee and that incorporated the batture into the park proper was abandoned for a lack of funding (Forman and Logsdon 1985:10, 19, 123; Galloway 1977:48-49, 72).

In 1924, the sugar experimentation station closed, making available fifty acres for additional baseball fields on which the Crescent City Baseball League and the New Orleans Steamship League played. One of the structures left from the sugar station was converted into a Community House, and the remaining stables were leased to a bridle club until their removal to their present location near Magazine Street in the 1930s. In 1928, a new natatorium or pool, accommodating 2,000 people at a time, as well as a new bathhouse, was opened. That summer, the natatorium saw 247,000 visitors. In 1949, the Park Commission purchased a square of land on Tchoupitoulas Street between Children's Hospital and the park, on which tennis courts later were built. Presently, the Audubon Park complex consists of three separate areas: the park and golf course, 60.7 ha (150 ac) of land located between St. Charles Avenue, Magazine Street, Exposition Boulevard, and Walnut Street; the Audubon Zoo, bounded by the Public Belt Railroad Tracks, Magazine Street, Exposition Boulevard, and Walnut Street; and the "Butterfly," the developed batture area, situated between the Public Belt Railroad Tracks, the Mississippi River, Exposition Boulevard, and Walnut Street (Forman and Logsdon 1985:53, 123; Galloway 1977:82, 84, 86).

Audubon Zoo

The Audubon Zoological Garden, which sits on 76.9 ha (190 ac) between Magazine Street and the railroad tracks on the levee, was created in 1919 with the expansion of the wildlife exhibit. A new aquarium brought ten thousand visitors on its opening day and forty thousand by the end of the month. The sea lion pool, a reptile exhibit and a monkey house followed, making the zoo a popular attraction separate from the rest of the park. The majority of the zoo moved to its present location and reopened as the Merz Memorial Zoo following a bequest from Valentine Merz in 1938 (Forman and Logsdon 1985: 37, 48, 58; Galloway 1977:79-81).

Due to a severe lack of funding during the 1950s and 1960s, the zoo fell into a serious decline, prompting one observer to label it a "zoological ghetto." Its revitalization began in 1972, when 100,000 citizens formed the Friends of the Zoo and city voters approved a millage tax, as well as bond issues, generating $1.9 million dollars for improvements (Forman and Logsdon 1985:63-64, 132, 137; Galloway 1977:79-80). By the early 1990s, the complete renovation of the zoo and all its exhibits had been completed. The Audubon Zoo now is widely recognized as one of the premiere zoos in the nation.

Audubon Park Batture, or the "Butterfly"

The final renovation that was completed in the late twentieth century was Audubon Landing, commonly called the "Butterfly" or "Fly." This 18.2 ha (45 ac) tract located between the Public Belt Railroad tracks and the edge of the river has been the most undeveloped part of Audubon throughout the history of the park. Maps dating from at least 1884 document the existence of a wharf at the foot of Walnut Street. As noted above, in 1881, the New Orleans Pacific Railway Company obtained a 99-year lease to build wharves, tracks and other depot facilities on the batture, but the lease was revoked after only three years, and no evidence of wharf construction was located during the current survey. A temporary wharf was completed in 1884,

just one month before the World's Cotton Exposition opened. Though it is unclear whether this wharf was a replacement for the existing one or a second wharf, it is likely that only one wharf existed at any given time in this location. Also, at the time of the fair, a single railroad track came from the west into the park. An unnamed wharf was depicted on the batture area of an 1894 Mississippi River Commission survey of the river. Pedestrian and bike paths along the riverfront were reported to be built with funds appropriated by the city in 1896; however, no evidence of the construction of these roads has been located (Cangelosi and Schlesinger 1997:42; Forman and Logsdon 1985:90, 93, 105, 108; Galloway 1977:17, 36, 42).

In 1898, when John Olmsted submitted his master plan for Audubon Park, he hoped the batture would become a promenade to view the river. But lack of funding, an Illinois Central Railroad lease to build tracks along a new levee, and at least one short-term lease of the area to the U. S. Army Corps of Engineers prevented this from happening in his lifetime (Forman and Logsdon 1985:78).

By the early 1930s, the Audubon Park Commission began anticipating the day when funds would become available to make the batture an integral part of the park, in keeping with the Olmstead vision. Beginning in 1933, New Deal funds were used to extend and build up the batture with river sand, hydraulically pumped in from the river. A 1933 blueprint produced by Frank H. Waddill, Consulting Engineer, depicted a plan to build a retaining levee approximately 30.5 m (100 ft) from the edge of the river. Between this retaining levee and the mainline levee, just riverside of the Public Belt Railroad tracks, fill would be deposited to elevate the mean level of the land to between 6.7 and 7.6 m (22 to 25 ft) above the mean water level (Figure 55).

However, funds for such an endeavor were scarce during the Depression, and apparently no levee was constructed at that time. Instead, the Commission invited city departments and the public to begin a landfill by dumping trash outside of the mainline levee (Figure 56). The sanitation department hauled in ashes from an uptown incinerator, as well as discarded refrigerators and washing machines. The area also was used as a cemetery for zoo animals. In November 1941, the park applied for $1.2 million dollars in federal funds to develop the batture according to the Olmsted plan. But the attack on Pearl Harbor and the outbreak of World War II prevented that project from taking off (Forman and Logsdon 1985:80-81, 125).

After the war, the Audubon Park Commission again turned its attention toward the development of the batture area. Large deposits of river sand laid the base for new land, but could not provide a stable landmass. The dump area was successful, but it was neither stable nor graded to an even surface. In 1959, the Commission let a contract for the construction of the retaining levee and hydraulic fill for the balance of the batture. Specifically, the contract called for the:

> ...[l]owering of the present trash fill grade to approximately (5) ft below the top of the now existing levee...[and] furnishing and setting up of hydraulic dredge complete with discharge pipes to fill the pit in the batture created by the grading and ring levees....[for] the filling of the entire Audubon Park Batture to the top of the existing Mississippi River Levee with a minimum of five feet (5 ft) of dredged material (Specifications for contract, Audubon Park Commission, University of New Orleans Special Collections #56, Portfolio 56-0:9, "Mississippi River Batture").

The Commission estimated that 7,646 cubic meters (270,000 cu ft) of additional river dredge was needed to grade the batture to a height even with the crown of the extant levee. By the time the operation was completed, twice that much dredge material had been used.

Blueprint designs from ca. 1951-59 indicate that, prior to the deposition of dredge material, the batture area consisted of two large trash piles, each of which ran parallel to the river (Figure 57). Each plateau rose approximately 6.4 m (21 ft) above the level of the previous batture. Between the two garbage hillocks lay a flat area of trash deposit, which was approximately 3.05 m (10 ft) shorter in height than the two peaks. Such a configuration obviously suggests grading of the extant trash layers prior to the deposition of river dredge. In fact, this aerial photograph of the Audubon Park batture, taken in 1960, when

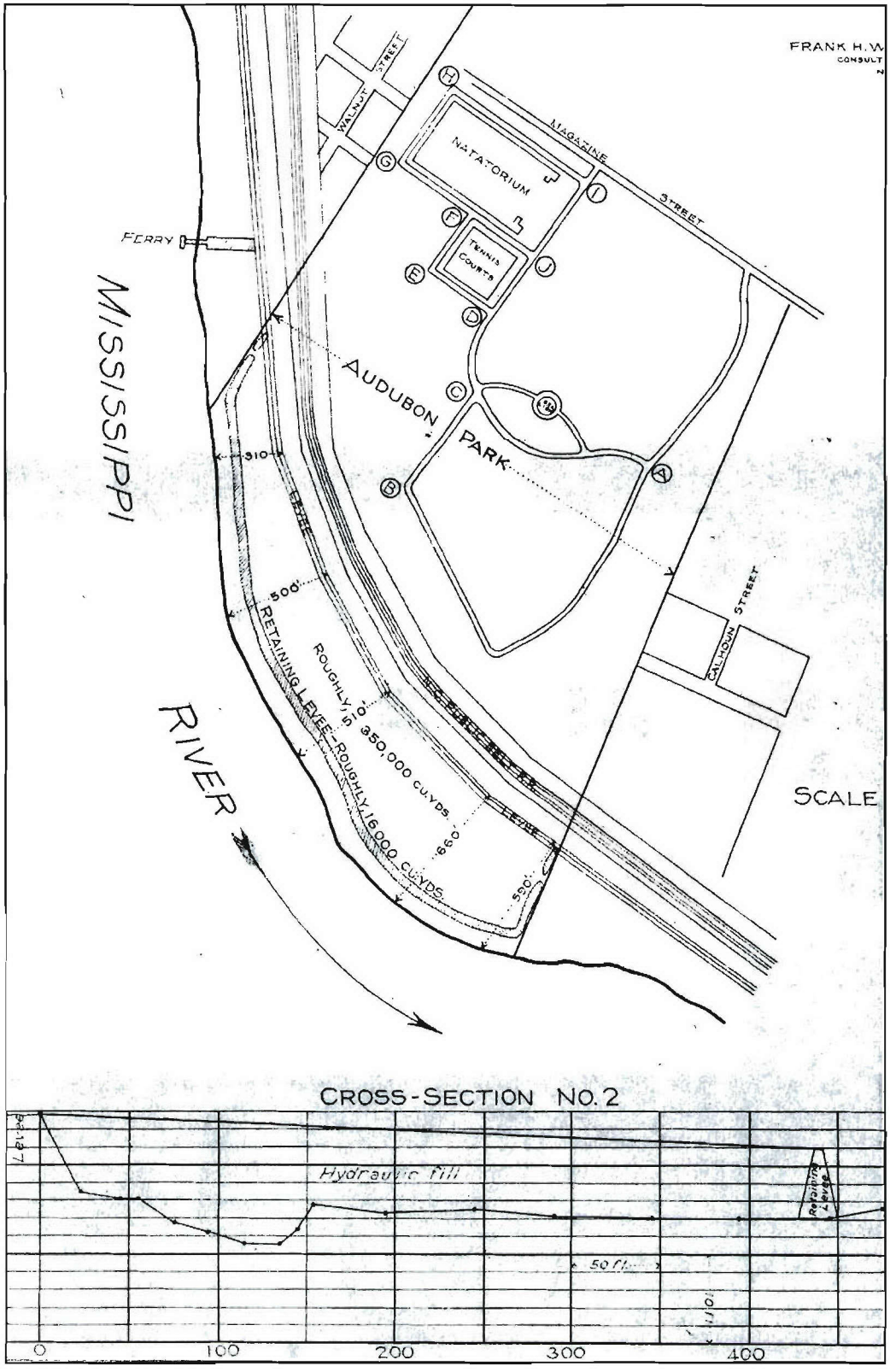


Figure 55. **This 1933 blueprint by City Surveyor Frank Waddill depicts the plan to raise the Audubon Park batture area by means of dredge deposit fill (Courtesy of University of New Orleans, Louisiana Collection, Audubon Park Commission, University of New Orleans Special Collections #56).**

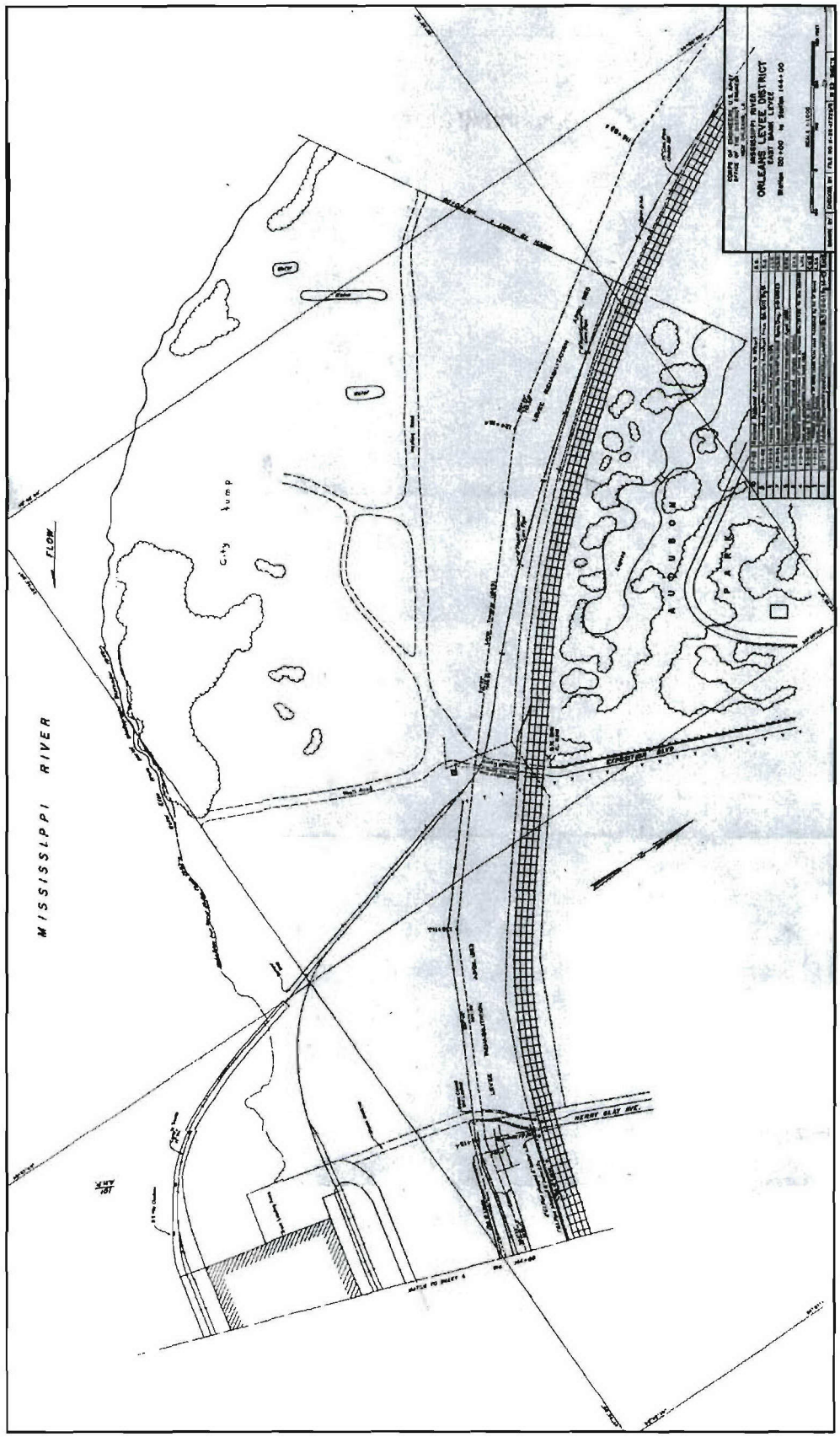


Figure 56. This United States Army Corps on Engineers map shows the Audubon Park batture area when it was the "City Dump" in the 1950s (United States Army Corps of Engineers, New Orleans District, map room).

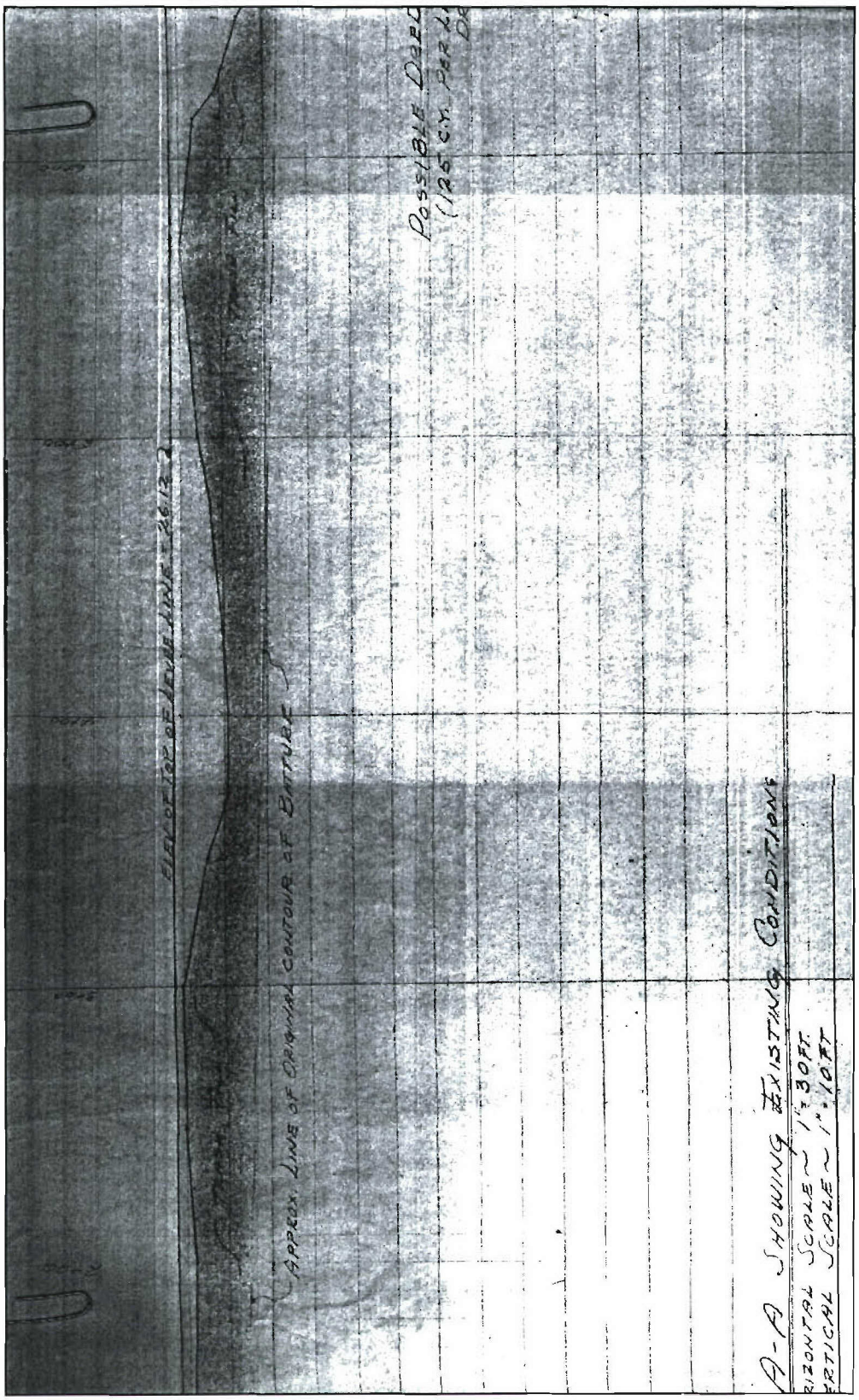


Figure 57. These engineering drawings from ca. 1951 depict the plan to raise the trash dump in the Audubon Park batture area to a uniform height (courtesy of University of New Orleans, Louisiana Collection, Audubon Park Commission, University of New Orleans Special Collections #56).

the contractor was in the process of depositing the dredge material noted above, shows, particularly in the project area, large chunks of trash. Moreover, a close examination of the photograph reveals bulldozer tracks, from the grading of extant trash deposits (Figures 58 and 59).

By 1961, the final grade of the Audubon Park batture was 8 m (26.12 ft) above the water line, and it represented the largest undeveloped tract of riverside land in New Orleans. This fact was noted by the "Dock Board," who promptly moved to construct a wharf and storage shed on the location of the former trash dump. A legal battle ensued, resulting in the Fourth Circuit Court of Appeals' finding that the Dock Board had no authority to take state land away from the Park Commission, which is itself a state agency (Forman and Logsdon 1985:126).

A 1967 bond issue provided some additional funding to develop the area. A riverfront park was constructed in 1968 to 1969, and the riverboat landing pier was erected in time for the 1984 World's Fair (Forman and Logsdon 1985:78, 82, 126). Additional recreational areas, including extensive baseball and softball diamonds, football and soccer fields, tennis courts, and one of the largest hills in New Orleans, all were constructed in the late twentieth century.

Archeological Expectations in the Project Area

Given the historical background of the area, a number of observations can be made regarding the archeological expectations in the currently proposed Carrollton Revetment Project Area. A number of different natural and artificial impacts to the Area of Potential Effect have had an effect on the archeological expectations for both the terrestrial and the marine components of the current project. The natural processes that affect archeological deposits along a riverbank include alluvial deposition, lateral migration, and natural crevasses. In the current project area, no historic crevasse has been noted, and lateral migration on the current bank has not occurred during the historic period. Alluvial deposition refers to those sediments deposited by the river during periods of overbank flooding. Natural alluviation has been altered by artificial levee construction. Man-made levees have protected the landward areas from inundation, and therefore from substantial alluvial deposition; this has circumscribed alluvial deposition on the batture (Elliott 1932:124-125). Where there has been substantial sediment deposition on the batture, though, it has obscured archeological deposits, often making them difficult to find using standard archeological survey techniques. This has been the case in the current Carrollton Revetment project area, where terrestrial Areas B, C, and D are located entirely on the batture, and where they are subjected to yearly flood episodes. Any archeological deposits extant in Areas B, C, and D would be located under several layers of sediment.

Moreover, multiple levee construction events push mainline levees back from the riverside. In these cases, the condition of archeological remains of any historic development between the older levee (closer to the river) and the new levee (further inland) depends on the method of construction used for the newer levee. In the case of the 1891 Broadway to Audubon Park levee, the land between the old and new bulwarks was used as fill during the construction of the new flood control structure.

In Area A, the creation of a city dump in the batture area could signal archeological potential for locating strata of urban refuse deposits. However, such potential is contingent upon stratified dumping episodes. Unfortunately, the mechanized alteration of the trash deposits by bulldozer, combined with the additional deposition of river dredge included in the final grading of the batture, virtually eliminates the likelihood of recovering intact data from the former location of the city dump.

In addition to the natural flood episodes and the effects of levee and dump construction, the presence of riverside commercial enterprises spanning the past century pose a threat to the endurance of archeological deposits. The ferry service, coal tipple, marine salvage, and derrick operations conducted by the Bisso family businesses between ca. 1893 and the present probably have disturbed the archeological record. For example, the ferry approach almost certainly changed from dirt and shell to asphalt with the advent of the automobile. However, no evidence of an asphalt road exists today. Moreover, the current road and fence configuration of the commercial enterprises differ from those indicated in Sanborn Fire Insurance maps from 1909



Figure 58. **This aerial photograph from 1960 clearly depicts the bulldozer tracks, indicating that trash and associated fill was not left in place, but was moved by heavy machinery (photograph taken by Amman Surveyors, on file at the Orleans Parish Public Library, Louisiana Division).**



Figure 59. **Another close examination of the 1960 aerial photograph indicates large masses of trash in certain areas (photograph taken by Amman Surveyors, on file at the Orleans Parish Public Library, Louisiana Division).**

to 1951. Because all three businesses, in all their many configurations, involved heavy machinery, both on and off shore, it should not be anticipated that the current state of archeological deposits in the commercial portion of the Area of Potential Effect would be pristine.

Finally, the architectural expectations are similarly poor. The extant buildings on all three Bisso family properties post-date 1970, and in no way match any of the configurations noted in the Sanborn Fire Insurance maps from earlier in the century. The batture dwellings, raised on stilts and connected to the levee by wooden walkways, were destroyed. The impermanence of those structures, combined with the wave, erosion, and deposition processes of the river on the batture has erased any traces of the structural piers. Only the ferry house would have been close enough to the shore to fall within the Area of Potential Effect.

CHAPTER V

MARITIME HISTORY AND VESSEL TYPOLOGY

The history of New Orleans and the history of the Mississippi River are inexorably intertwined. The river is the reason Bienville chose the site for his colonial empire, and it has been at once the ally and the adversary of the city ever since. Situated just far enough from the Gulf of Mexico to be protected from the harsh fall hurricanes, yet just close enough to make it an effective deep-water port, New Orleans, from its inception, has been the singular hub of oceanic and riverine commerce in the nation. That very singularity drew colonists and immigrants from all over the world to the banks of the Crescent City, creating a cultural heritage that shapes the character of the city even now.

From a maritime context, the confluence of both riverine and transcontinental commerce at New Orleans makes the city unique among ports in the United States. Most coastal ports in the country are oriented to the sea, while inland ports, such as Pittsburgh, serve primarily inland rivers and lakes. The deep-water Port of New Orleans, however, traditionally has served both the sea and the river so that there was, and still is, a great confluence of waterborne commerce at the port. Even today, no port in the United States handles more inland waterway traffic than New Orleans. Huge volumes of traffic from the western rivers arrive in New Orleans; these cargoes in turn are shipped out across the Gulf of Mexico on seagoing vessels. Products arriving from abroad on seagoing ships are transported upriver as return cargoes.

In fact, the singular position of New Orleans was a primary impetus for the Louisiana Purchase. As Thomas Jefferson once noted of the city:

> New Orleans will be forever, as it is now, the mighty mart of the merchandise brought from more than a thousand rivers.... This rapidly increasing city will, in no distant time, leave the emporia of the Eastern World far behind. With Boston, Baltimore, New York, and Philadelphia on the left; Mexico on the right; Havana in front, and the immense valley of the Mississippi in the rear, no such position for the accumulation and perpetuity of wealth and power ever existed (Thomas Jefferson, quoted in Campanella 2002:36).

His words still apply, two hundred years later.

The extraordinary geographical position of the city has resulted in an equally remarkable diversity of vessels present in the port over the span of the historical record. These vessels all possessed unique design features - designed to harness the power of the river, to withstand the ferocious Caribbean storms, to transport the wealth and the wealthy around the Atlantic World, and to fight the tireless downstream current. This chapter reviews the history of riverine traffic that may have had an effect on the current project area, focusing primarily on foreshore activities, as well as on the vessel typology of those ships, boats, barges, and rafts that floated over or adjacent to the Area of Potential Effect.

Vessel innovation and design advancement along the Mississippi River flowed primarily from commercial necessity. Even the

initial site location of the city was selected because it was located near the shortest portage from river to lake; that is, the most efficient overland route to carry supplies, cargo, and canoes. The convergence in New Orleans of river vessels, ocean vessels, and port-related vessels creates a unique opportunity to summarize the evolution of these nautical design themes.

The adaptation of "kaintuck" flatboats, log rafts, tugboats, keelboats, bateaux, and steamboats all stemmed from economic necessity on the "Big Muddy." Additional craft evolved in direct response to historical influences related to river commerce. Changes in vessel design and propulsion largely resulted from the increasing port traffic, and the unique commercial exigencies of a combined river-ocean port.

The task of identifying the cause for each discrete vessel design innovation is beyond the scope of this study; however, general historic trends influencing broad changes in vessel typology are identified below. The thrust of this chapter is to identify the primary vessel types that historically have plied the waters of the Mississippi River; that is, those vessels that might have had an impact on the current Area of Potential Effect. Additionally, those commercial activities that influenced the use and development of the river and riverside are examined. The chapter is organized into four sections: foreshore activity in the Port of New Orleans, vessel typology of Mississippi River boats, ships in New Orleans that primarily sail the ocean, and maritime craft that serve as workboats in and around the port.

Foreshore Activities

The batture area along the river in New Orleans has been the location of common storage areas, flood control structures, wharves, landings, ferries and ferry houses, railroad crossings, and even raised dwellings. All of these activities may have left historical, archeological, or structural remains in the current project area. The commercial activities associated with the wharf and ferry landing in the Carrollton Revetment project area have been discussed above, in Chapter IV.

Changes in volume and type of river commerce had an effect on associated activities along the waterfront. For example, the decline in sugar and cotton exports during and immediately after the Civil War resulted in a significant and parallel diminishment of steamboat and wharf traffic in the Port of New Orleans. However, when the staple-crop economy began to rebound in the 1880s, steamboat traffic and wharf activity again increased to meet the commercial demand. As river traffic increased, the city began an effort to control and organize commercial enterprises that occurred along the river and riverbank.

A Currier & Ives "bird's eye view" of New Orleans executed in 1885 illustrates the historic confluence of waterborne commerce (Figure 60; Currier & Ives 1885). Along the New Orleans waterfront were found steamships and sailing vessels of many sorts. The sailing vessels were of two kinds; i.e., those that are strictly sailing ships and those equipped with steam engines as well as sail. By the mid 1880s, the majority of seagoing steam vessels utilized the screw propeller. The seagoing side-wheel steamers, such as those that supplied the Confederacy during the Civil War, were fast disappearing as a result of the refined propeller shape and the development of efficient and high power direct-drive engines (Gardiner 1993:96, 103). By comparison, river craft still employed paddlewheels to a great extent. These were installed either as side-wheels or stern-wheels. In the 1885 Currier & Ives drawing, the side-wheel steamers are somewhat more numerous. In the drawing, seagoing vessels appear proportional to river craft, clearly demonstrating the dual orientation of this port.

The Currier & Ives drawing and others of the same genera are valuable sources of information regarding vessel types and waterfront activities, since they represent a snapshot of what operated on the river and took place on the waterfront during a very short and specific period of time. By examining drawings spanning a length of time, one may detect changes in vessel types and activities. This point is best illustrated by the discussion of the towboats below.

Because New Orleans is located several miles upriver from the Gulf of Mexico, the city did not have any open harbor or roadstead like its coastal counterparts. The city of New Orleans did not build wharves until 1820 (Reeves and Reeves 1990:52). Therefore, to avoid blocking the channel and posing a hazard to



Figure 60. **This illustration, entitled "The City of New Orleans, and the Mississippi River, Lake Pontchartrain in the Distance," was published by Currier & Ives in 1885. All along the river and waterfront, the extraordinary variety of vessels types can be seen, illustrating the confluence of waterborne commerce (Currier & Ives 1885, courtesy of the Library of Congress).**

river navigation, all traffic, both maritime and riverine, had to find space along the bank of the Mississippi River in the vicinity of New Orleans until wharf space became available to unload at the port. Consequently, the riverbank for miles above and below New Orleans was utilized by both seagoing and river craft to tie up.

For most of the antebellum era, wharves were owned by the city, but leased by individual lessees, who were responsible for their maintenance and upkeep. By the late nineteenth century, the leased wharf policy gave way to privately owned wharves. Finally, in 1896, the New Orleans City Council created the Board of Commissioners of the Port of New Orleans, known locally as the "Dock Board." The Dock Board consolidated the riverside commerce in the city, setting universal wharfage rates, instituting regulations for use of and storage on the batture, and codifying loading and labor convention.

By 1845, the developed waterfront consisted of wharves built at the terminus of all streets running to the river and extended upriver as far as Ninth Street (Figure 61). This was still the case in 1858, with no apparent new wharf development upriver of Ninth Street (Figure 62). The waterfront from Celeste Street (near Felicity) downriver to the center of town in front of the *Place d'Armes* was much more densely packed with wharves and piers. Between these street-end wharves lay the natural riverbank, also heavily used by waterborne commerce.

When space was especially tight on the waterfront, several vessels tied up alongside one another and unloaded cargo across the decks of interior ships to land it on the quay (Figure 63). Vessels in the first row adjacent to the wharf, or bank, were legally obliged to tie up in a sufficiently secure manner as to hold any vessels that might tie up outside of them. In cases where three vessels were actually tied up together, the third vessel, furthest from the bank, was required to deploy an anchor (Reeves and Reeves 1990:56). It is interesting to note that steamboats and sailing vessels tended to be docked apart from one another in different sections of the waterfront (Figure 64).

Captains waiting to unload, therefore, had to find bankline space to moor their vessels above Ninth Street. The Area of Potential Effect in the Carrollton Bend may well have been used for mooring in 1845 and before. Certainly, from mid nineteenth century until the Bisso family developed the batture property at the foot of Walnut Street, the bankline in the project area was utilized in this fashion. Thereafter, that family, and its subsequent and varied corporate offshoots, used the project area bankline and adjacent water, and to this day, this area of the river still is heavily used.

Foreshore activity in New Orleans area, such as river logging, required watercraft suited to its purpose both functionally and economically. The bird's eye view of New Orleans by J. Bachman depicts the New Orleans waterfront ca. 1851 (Figure 65). A close examination of the lower West Bank area illustrates a wood yard in operation in the vicinity of Harvey. These logging or timber salvage facilities in some cases retrieved their resources from the river, rather than the forest (Figure 66). In the illustration, a man stands on what appears to be a pair of logs lashed together. He is just off the shoreline and moving towards a log heading down the river. In his hand he has a hook for snagging the log and securing it to his craft to tow into shore. His makeshift watercraft is either moored to the shore with a line to pull himself landward, or else he may have used a pole for the purpose of manipulating his craft. Often skiffs or small luggers may have been employed further out in the river.

Along the shore are a number of logs that have been retrieved in a similar manner. Further up on the foreshore are neat and tall stacks of timber cut to equal lengths. The size of the timber suggests that they may have been intended as fuel for river steamboats. A small shed nearby may have been a facility for wood splitting in rainy weather, as well as shelter for the woodman's tools.

By 1885, when Currier & Ives executed their bird's eye view of New Orleans, these West bank wood yards were no more. Riverfront access and use evolved, and landings replaced wood yards (Figure 67). Although, in this depiction, stacks of timber are present on the shore, they are processed lumber boards, and most likely cargo for loading on the awaiting stern-wheelers. The decline of riverside

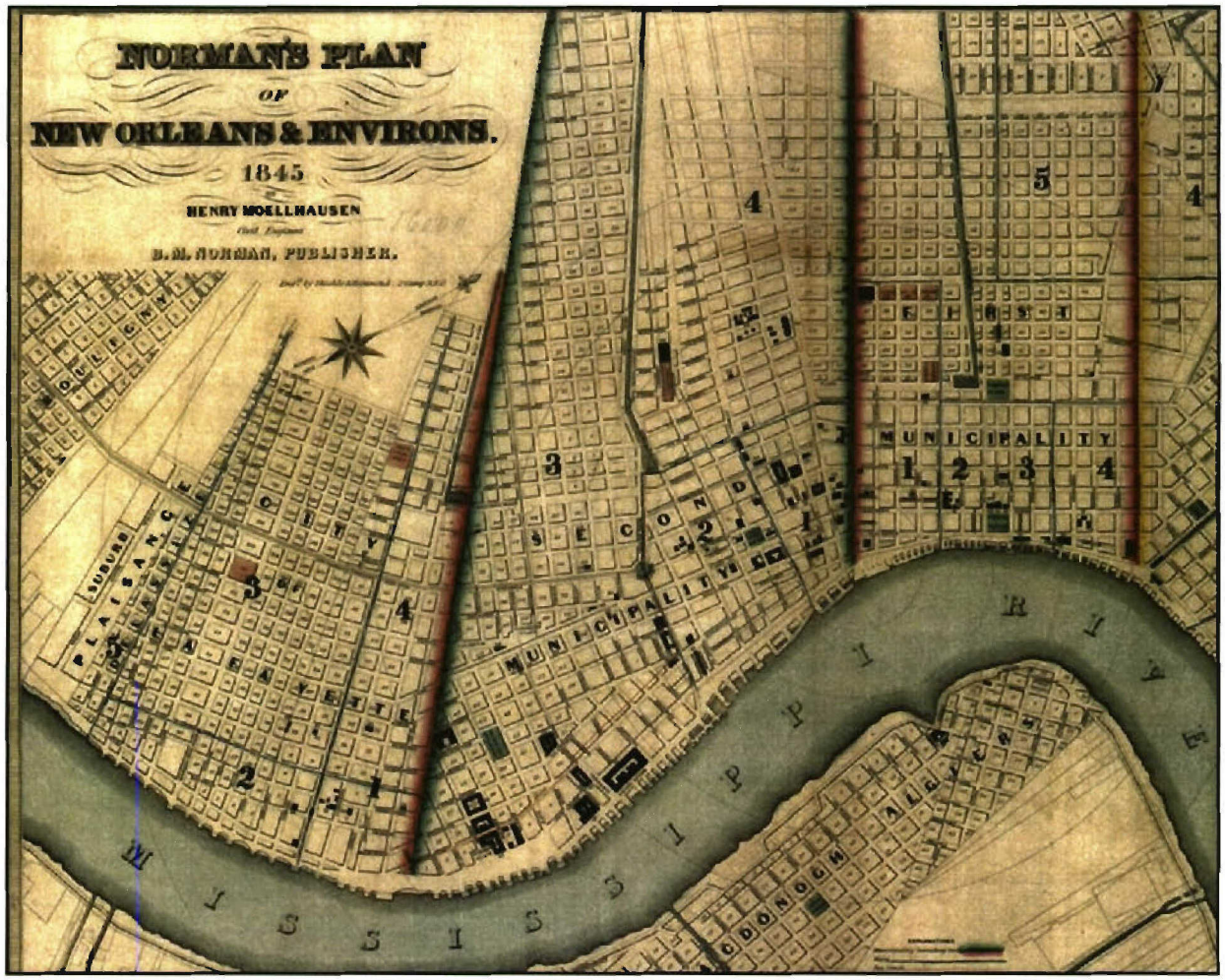


Figure 61. **This excerpt from an 1845 map of New Orleans was drawn by Henry Möellhausen. Small finger wharves are visible along the waterfront throughout the city, and even into the City of Lafayette, later incorporated into New Orleans proper (Möellhausen 1845, courtesy of the Library of Congress).**

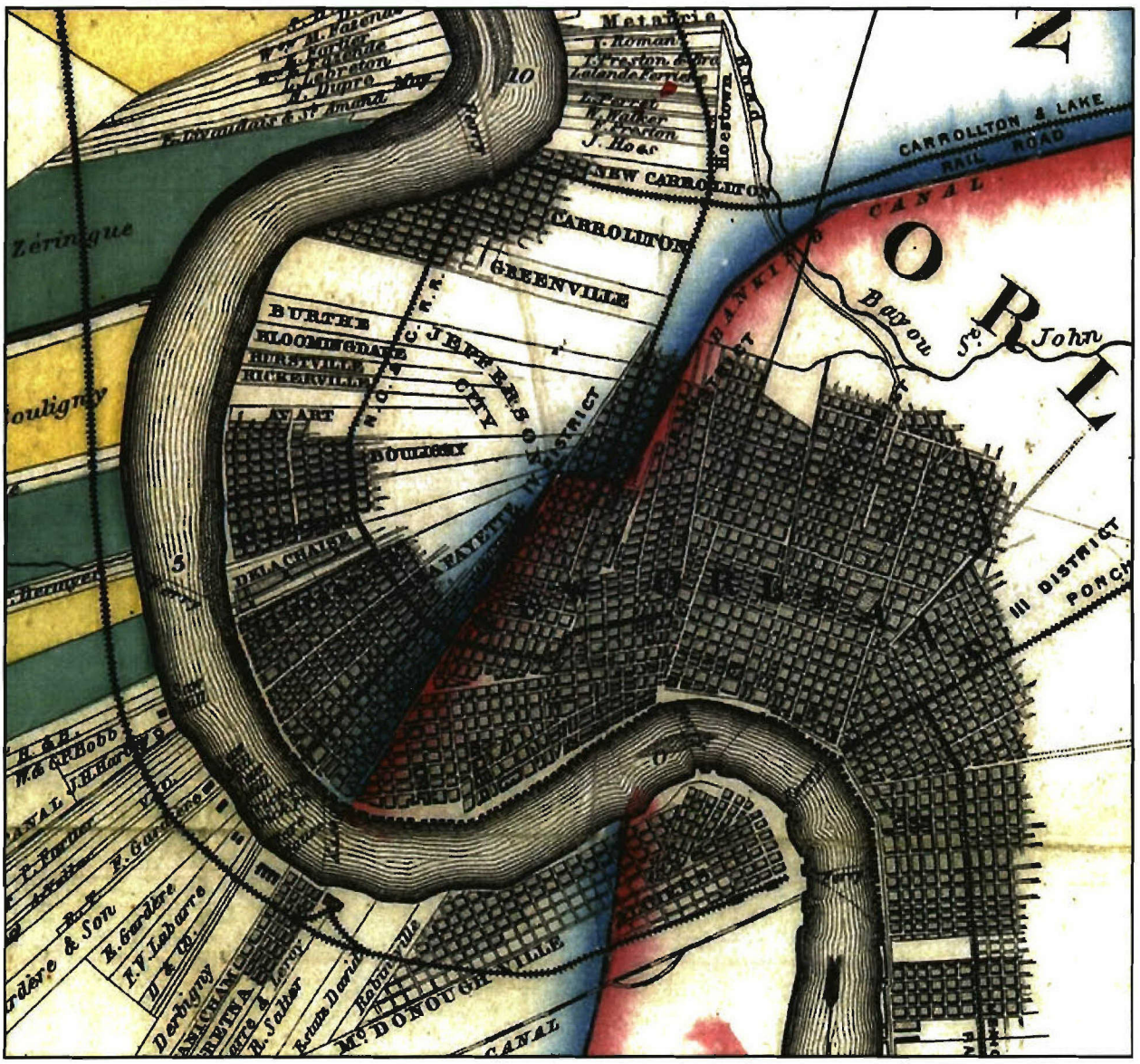


Figure 62. **[1858] This excerpt from "Norman's Chart of the Lower Mississippi River," drawn by Marie Adrien Persac, depicts wharf and waterfront development in New Orleans just before the Civil War (Persac 1858, courtesy of the Library of Congress).**

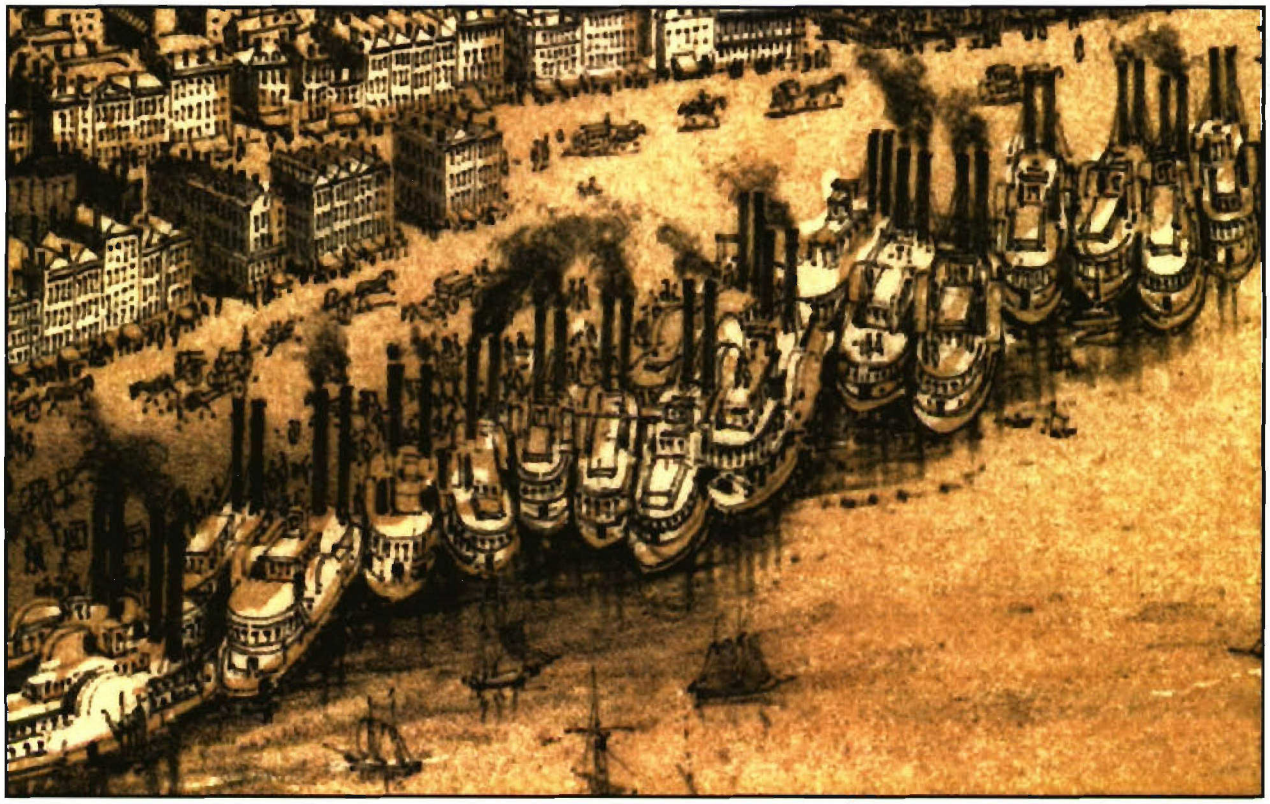


Figure 63. **This excerpt from Bachman's "Bird's Eye View of New Orleans" illustrates the limited amount of waterfront space available for docking. Here, many vessels can be seen tied-up together, moored only to the vessel next to them; in these cases laborers unloaded cargo across the decks of interior ships (Bachman 1851, courtesy of the Library of Congress).**



Figure 64. **This excerpt from the same print (Bachman 1851) depicts the area just upriver from the previous figure. This area obviously served as a landing site for sailing vessels, rather than steamboats; however, like its downriver counterpart, docking space still was limited, and sailing vessels moored alongside one another, several ships deep (Bachman 1851, courtesy of the Library of Congress).**



Figure 65. **This panoramic map, similar to illustration published by Currier & Ives, was illustrated J. Bachman, and is entitled "Bird's Eye View of New Orleans." This sketch was published in 1851, and it illustrates the antebellum era on the river (Bachman 1851, courtesy of the Library of Congress).**



Figure 66. **[1851] This excerpt from Bachman's "Bird's Eye View of New Orleans" depicts a woodyard in operation on the West bank of the Mississippi River, opposite New Orleans. These were logging or timber salvage facilities that sometimes retrieved their resources from the river rather than the forest (Bachman 1851, courtesy of the Library of Congress).**

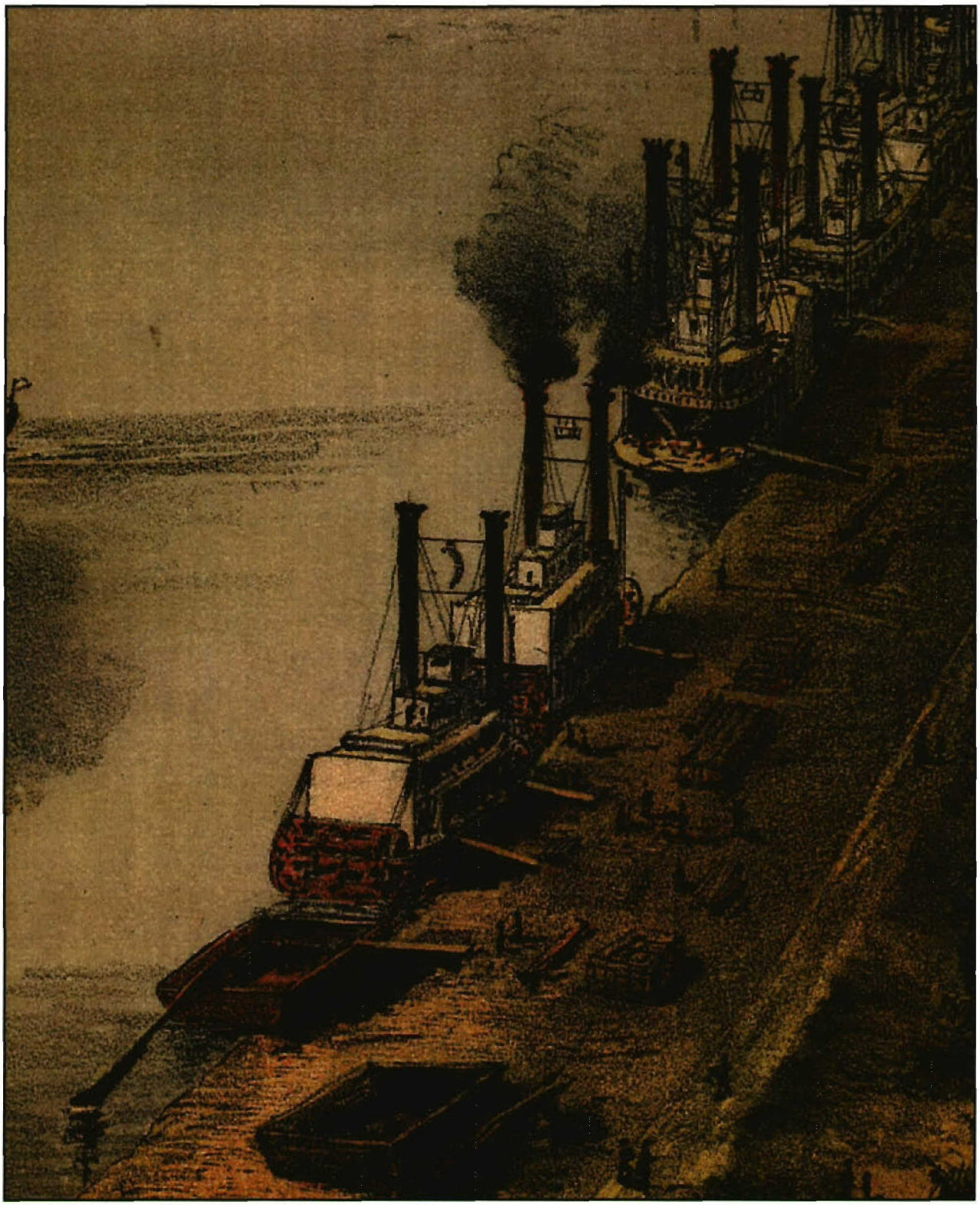


Figure 67. **This excerpt of the Currier & Ives panorama "The City of New Orleans," was executed 25 years after the previous figure; however, by that point, the woodyards on the West bank had been replaced by steamboat landings (excerpted from Currier & Ives 1885, courtesy of the Library of Congress).**

wood yards was noted by foremost Mississippi River commentarist, Mark Twain, who lamented:

> ...but alas for the wood-yard man! He used to fringe the river all the way; his close-ranked merchandise stretched from the one city to the other, along the banks, and he sold uncountable cords of it every year for cash on the nail; but all the scattering boats that are left burn coal now, and the seldomest spectacle on the Mississippi to-day is a wood-pile. Where now is the once wood-yard man? (Twain 1960:Ch. 22).

Wood yards were a relatively low impact industry that could easily spring up on any section of the Mississippi riverbank, and the vicinity of New Orleans provided a very ready market. It is clear that several wood yards existed along the river batture in the Carrollton neighborhood, and it is possible that in addition to mooring, the shoreline in the project area may have been utilized as a wood yard at some point in the early steam period on the Mississippi River (see Chapter IV).

Several other foreshore activities might have had an influence on the project area. The construction of the 1853 and the 1891-93 levees, as discussed above, certainly changed the use and configuration of the land pattern in the current Carrollton Revetment project area. Moreover, in the last decade of the nineteenth century, it seems clear that the shoreline area in the vicinity of the project area was an active wharf. One source notes that as of 1891 along the batture of Walnut Street, "a small dock yard is also in operation, two iron tugboats having been already constructed" (*New Orleans Times-Democrat* July 30, 1891:3, column 8).

By the twentieth century, the primary foreshore activity in the project area consisted of the ferry, coal depot, and derrick operations described in Chapter IV. Land use patterns set early in the century continued throughout the evolution of the New Orleans Coal & Bisso Towboat Company into Bisso Towboat, Inc., E.N. Bisso and Son, Inc., and Bisso Marine, Inc. The primary vessels that were in use throughout the twentieth century in the immediate project area were river work boats.

River Craft

No single event influenced the development of river vessels more than the Louisiana Purchase in 1803. The river immediately became the primary transportation corridor for goods within the growing nation, as well as between America and her international trade partners. Early vessels designed to travel the river were either one-way vessels, such as rafts and flatboats, or vessels that were pulled or polled up the river against the current.

The advent of steam engines dramatically affected Mississippi River traffic, making efficient travel against the flow of the river possible. These steam-powered vessels, first sidewheelers and then stern-wheelers, revolutionized cargo movements around the nation. Additionally, the new vessels were capable of traveling between New Orleans and the western rivers in less than a month. The reduced voyage time spurred a new passenger industry.

The final historic innovation that influenced river traffic and vessel design was the invention of the snag boat. The prototype, built by Henry Shreve, was designed to eliminate hidden snags along the river. This essentially created a clear transportation corridor, with less chance of vessels sinking after collisions with underwater trees, branches, and other debris.

The dual utilization of the New Orleans port for riverine and seagoing vessels resulted in a variety of river and sea craft. The variety of river craft that plied the Mississippi River included vessels that were as simple as dugout pirogues and as complex as paddlewheels, railroad ferries, and dredges. The types of river craft commonly found along the Mississippi River are enumerated in Table 8.

Dugout Pirogue

With its name adapted from the Spanish *Piragua*, the dugout pirogue was made from a single log. It was essentially a continuation of the Native American tradition of dugout canoe construction. This method of fabrication was accomplished using a combination of fire and stone or shell tools in the pre-contact period; as Europeans and their descendents built these craft, they utilized iron tools speeding up the

Table 8. Typology of River Craft of the Mississippi River.

Vessel Type	Length Range (ft)	Beam Range (ft)	Depth Range (ft)	Gross Tonnage Range	Propulsion	Defining Characteristics
River Craft						
Dugout Pirogue	6' to 30'	3' to5'	1' to 3'	0.1-30	Paddled	Hollowed log construction
Bateaux	30' to 33'	4' to 5'	1' to 3'	0.1-30	Paddled/polled	Flat bottomed
Keel Boat	40' to 80'	7' to 10'	3' to 5'	15-30	Sailed/rowed/polled	Polled upriver
Flatboat	20' to 100'	12' to 20'	3' to 5'	25 to 170	Paddled	Box-like construction
Side-wheel Steamer	60' to 335'	20' to 51'	2' to 9.5'	100 to 800	Steam engine	Twin side paddlewheels aft of amidships
Stern-wheel Steamer	60' to 235'	13' to 40'	2' to 5.9'	25 to 600	Steam engine	Single large paddlewheel at stern
Snag Boat	100' to 150'	40' to 50'	3' to 5'	N/A	Steam engine	Large derrick forward for hoisting logs
New Orleans Lugger	15' to 100'	3.5' to 25'	2' to 10'	0.1 to 600	Sailed	Lugg rigged sails

construction process. These pirogues varied in size to accommodate varying amounts of cargo.

During the early eighteenth century, French settlers rowed convoys of between 20 to 30 large cargo-laden pirogues from New Orleans upriver to the Illinois country, as the middle and upper Mississippi River was then known. The finished goods were exchanged for furs that formed the primary return cargo for New Orleans (Pearson et al. 1989:79-80). This constituted some of the earliest documented European trade along the Mississippi River, and it is one of the earliest indicators of the confluence of riverine and maritime trade at New Orleans. In later centuries, the tree trunk construction method existed on a scale; the pirogue still exists in Louisiana (Figure 68).

Bateaux

Bateaux were double-ended vessels, typified by a sharp bow and stern. A bateaux characteristically had a narrow beam and light draft. Both French and English colonists used these craft throughout eastern North America, as European needs outstripped the Native American canoe or pirogue. The bateau was entirely a New World invention, and it did not resemble any boat type in Europe. This vessel type came into use when developing commerce surpassed the capacity of the pirogue. Bateaux, like pirogues, came in many shapes and sizes. Construction techniques and timber dimensions differed slightly depending on the size of the vessel and the geographic area of construction. These craft ranged from two tons up to 30 or more tons (Pearson et al. 1989:80). Typically, sailors rowed these vessels, though they could be rigged with sails when wind and current made such a configuration expedient. Steerage of the bateaux was carried out with the use of a rudder or "scull" (Bass 1996:130-133).

These vessels became the standard for two-way travel on the Mississippi River and its tributaries during the eighteenth century. A related vessel type, the "bateaux plats," was operational in the Gulf of Mexico, where they connected the ports of New Orleans, Biloxi, and Mobile. The ability to travel both the river and the coast is an indication of the versatility of this vessel type, and of its importance in the dual orientation of the New Orleans port.

Keelboats

Keelboats were carefully built craft that sailed and drifted from the upper rivers down to New Orleans where the cargoes were sold. They were either then scrapped for their wood or laboriously polled and warped upriver with a cargo for the interior. A return trip by a keel could take up to nine months. As a result, the Keelboat man has been credited with the development of the western country, for it was he who supplied the western expanse between



Figure 68. **A modern pirogue, shown in this photograph, is no longer constructed from a hollowed-out log; however, it remains a very simple design, using few timbers (Courtesy Uncle John's Inc., n.d.).**

Pittsburgh and New Orleans with finished goods and other products (Baldwin 1980:5).

Polling involved members of the crew planting their polls in the river bottom, facing the stern, and then putting their shoulders, legs, and backs into walking the keel upriver under their feet (Figure 69). As the keel advanced, crewmen raised their polls as they approached the stern. Finally, they walked forward to the end of the crew line, and repeated the process. In order to facilitate the pollers, the deck or piste that they tread had small wooden coamings that ran perpendicular to the gunwales, providing the keelmen with better footing.

With the advent of steam power on the river, keels usually made the trip to New Orleans, where they sold the vessels for wood and materials. The boatsmen, flush with the profits of their cargo, returned upriver as deck passengers on a steamer. Keels and steamers co-existed on the river for 15 to 20 years before keelboats yielded entirely to steam power. Steamboats increased in numbers and speed so dramatically that they absorbed all river trade, and keelmen became deckhands, mates, and pilots on steamers. If no steamer berths were available keyboat men crewed on voyage, keelboat men often crewed on Pittsburgh coal flats or on pine rafts constructed in the northern forests of the Mississippi drainage basin (Twain 1960:10).

Flatboats

Flatboats, also known as broadhorns for the great oars that protruded from their sides, played an important role in the history of the Mississippi and of New Orleans. Before and during the era of the steamboat, flatboats carried vast amounts of cargoes from the interior of the United States to western river ports. From these ports, cargo floated down the Mississippi to the major river ports of Cairo, St. Louis, Memphis, Natchez, and finally New Orleans (Figures 70 and 71). Upon arrival in New Orleans, flatboat crewmen broke up their vessels, and sold the wood for timber. Their crews returned north via keelboat, or by horse and foot along the Natchez Trace.

A seasonal cycle dictated the schedule of flatboat, timber rafts, and all other craft that floated down river. Their long journeys commenced when the river ran high in the spring. While this presented some dangers, since the river was at its wildest, it allowed the prospect of completing a journey without being trapped somewhere by low water. The advent of steam caused friction between the established system and the new vessels. Steamboats, much larger and faster, posed a collision hazard to flatboats or keels, especially at night:

> Of course, on the great rise, down came a swarm of prodigious timber-rafts from the head waters of the Mississippi, coal barges from Pittsburgh, little trading scows from everywhere, and broad-horns from 'Posey County,' Indiana, freighted with 'fruit and furniture'--the usual term for describing it, though in plain English the freight thus aggrandized was hoop-poles and pumpkins. Pilots bore a mortal hatred to these craft; and it was returned with usury. The law required all such helpless traders to keep a light burning, but it was a law that was often broken. All of a sudden, on a murky night, a light would hop up, right under our bows, almost, and an agonized voice, with the backwoods 'whang' to it, would wail out--'Whar'n the ---- you goin' to! Cain't you see nothin', you dash-dashed aig-suckin', sheep-stealin', one-eyed son of a stuffed monkey!' Then for an instant, as we whistled by, the red glare from our furnaces would reveal the scow and the form of the gesticulating orator as if under a lightning-flash, and in that instant our firemen and deck-hands would send and receive a tempest of missiles and profanity, one of our wheels would walk off with the crashing fragments of a steering-oar, and down the dead blackness would shut again. And that flatboatman would be sure to go into New Orleans and sue our boat, swearing stoutly that he had a light burning all the time...(Twain 1960:Ch. 10).

Flatboats outlived the keels after the steamboat came along. If speed of delivery was not an issue, they were still a very economical way to ship small to large cargoes down river. These vessels, however, were not the only small craft to float the Mississippi. A large number of vernacular watercraft sailed the river, especially in New Orleans.

Steamboats

Although designer Robert Fulton is widely regarded as the inventor of the steamboat, several individuals throughout the late eighteenth and early nineteenth century experimented with

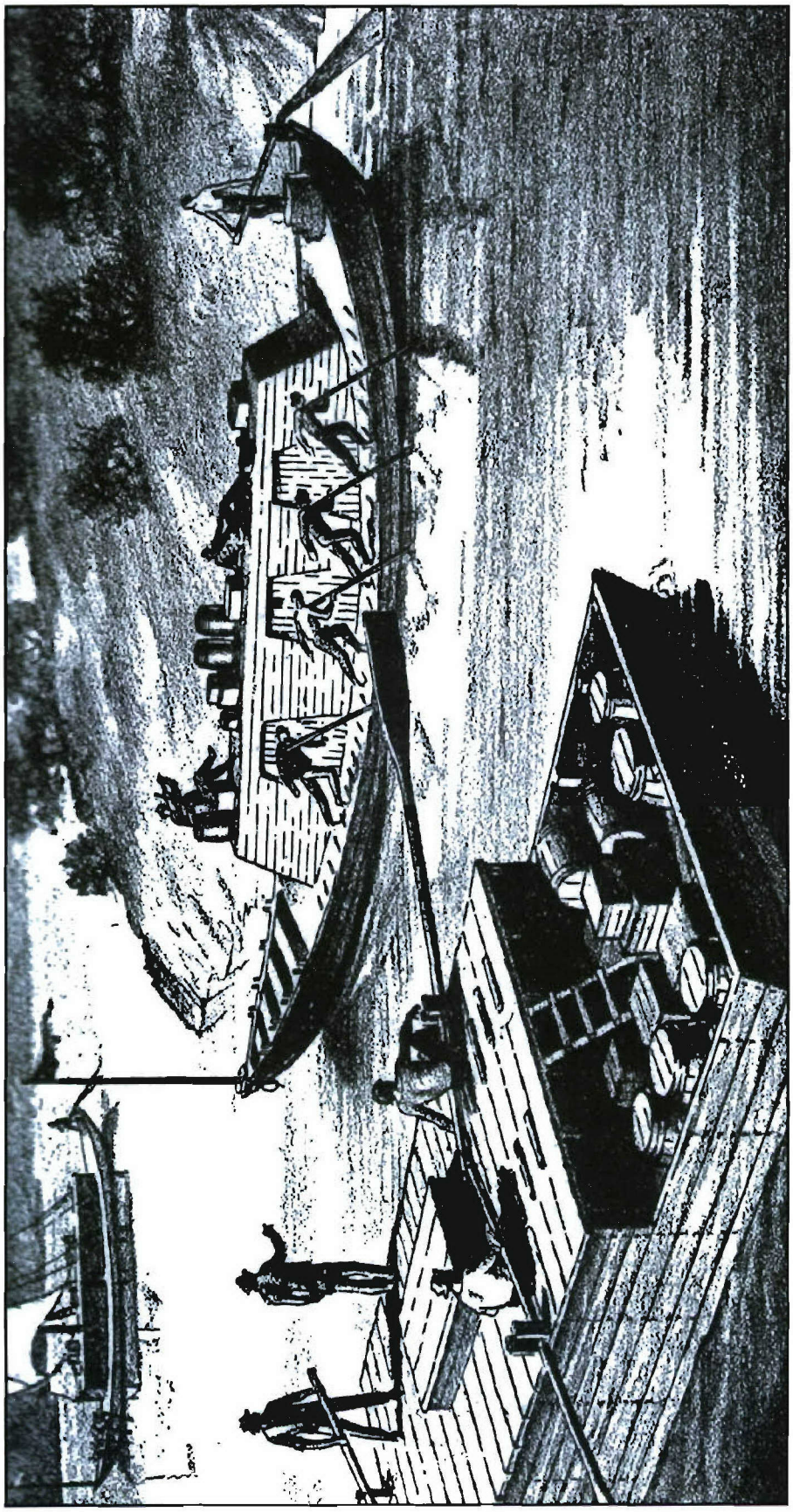


Figure 69. This illustration depicts the manner of polling a keelboat upriver. Note the tholepins in the bow for four sets of oars. A flatboat can be seen in the foreground, floating downriver with crew and cargo (excerpted from Baldwin 1980).



Figure 70. **This modern painting, "Ross Landing on the Tennessee River in 1848" by John Stobart is a fanciful depiction of the era when flatboats and steamboats shared transportation routes. In the foreground, donkey carts tote the cargo to the landing, where flatboatmen load it onto their craft (Courtesy of the Scrimshaw Gallery, n.d.).**



Figure 71. **This painting, "Mississippi flatboatmen, navigating past Tower Rock, 1831" by Gary Lucy is a modern depiction of a flatboat trip. The artist accurately includes the stacked lumber, barrels, and animal skins in the cargo of the two craft (Courtesy of the Old Glory Gallery and Frame Shoppe, n.d.).**

steam vessels. It was Henry M. Shreve, an experienced keelboat captain, who had the most crucial success in the advancement of steamboats. In 1815, he took the newly designed steamboat, the *Enterprise,* on the Mississippi from New Orleans to Pittsburgh, the first successful upriver journey of a steam-powered vessel. This was the first of many such sailings on what was to become one of the best known of the established trade routes. He followed this up two years later in a vessel of his own design, the *Washington.* The trip took twenty-five days, or a little less than a quarter of the time it took to pole a keelboat against the current; this was the beginning of the end for the keelboat. Henry Shreve went on to invent and develop the snag boat to remove sunken logs that frequently were the cause of shipwrecks and other disasters. The development and application of steam power to navigation of the Mississippi River, combined with the use of the snag boat,were the most significant events in the development of navigation on the Mississippi River.

The flat-bottomed, shallow-draft hull of the western river steamboat was developed over the course of some three decades between the early 1820s and 1850s (Bass 1996:194-195). Steamboats were divided into two types: side-wheelers and stern-wheelers.

Side-Wheel Steamboats

Side-wheel steamboats were abundant on the western river system; however, both screw propellers and stern-wheels eventually outpaced the side-wheeler. These two design advances made the ships easier to dock, since no wheel obstructed either port or starboard side. The newer vessels also boasted larger carrying capacity, since they did not have the side-wheel machinery taking up valuable cargo space in the center of the vessel.

Stern-Wheel Steamboats

During the second half of the nineteenth and the first four decades of the twentieth century, a great number of stern paddlewheel steamboats operated on the Mississippi River and its tributaries. The *Mary B.* is an excellent example of a typical, stern-wheeler dating from the early twentieth century (Figure 72). Enrollment documents indicate the vessel was built at New Orleans in 1903.

The enrollment records of the *Mary B.* indicate that it was of wood construction. Surveyors of customs at New Orleans certified the vessel as a wooden, single decked, stern-wheel steamboat with no masts, a plain head, and a square stern. It was measured at New Orleans on April 24, 1903, and was certified as being 29.6 m (96.9 ft) long with a breadth of 6.3 m (20.8 ft) and a depth of 1 m (3.3 ft). The gross tonnage of this vessel was 84 tons. The *Mary B.* was enrolled on May 11, 1903, with the official number 93377, Certificate No. 41. Joseph Bisso was her master, and presumably she was named for his wife, Mary Bisso (Records of the United States Customs Service, Enrollment Book No. 10 March 20, 1900 to June 30, 1905:103).

The *Mary B.* had an attenuated working life, lasting only three years. During that time, it pushed timber rafts, hauled small cargo, and took on an occasional passenger or two. Appearing on the page opposite the enrollment document noted above is a Loss of Vessel form from the Bureau of Navigation. The form reports that the Bureau of Navigation had received information from the United States Life-Saving Service reporting the total loss of the *Mary B.*, official number 93377. The vessel foundered at Belle Point on the Mississippi River on March 21, 1906 (Records of the United States Customs Service, Enrollment Book No. 10 March 20, 1900 to June 30, 1905:103).

No further information regarding the loss of the *Mary B.* is contained within the document. However, the vessel clearly won a place in the hearts and minds of the Bisso family, for in the years to come, another *Mary B.* took its place. This latter vessel would serve out the remainder of its working life in the New Orleans Coal & Bisso Towboat Company, eventually sinking in the current project area.

Steam Packets

A packet refers to small or moderate vessels, either side-wheelers, or stern-wheelers, that did not carry large cargoes. These vessels primarily carried passengers, mail, and goods on scheduled, fixed routes. These craft gener-



Figure 72. **This photograph depicts the stern-wheel steamboat the *Mary B*, between 1903, when it was launched, and 1906, when it sunk at Belle Point. Note that it was obviously taken from the deck of another steamer (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

ally could be distinguished from other steamers by the ornate nature of the guard rails and other relatively finer finishing work and gingerbread that would appeal to passengers and secure their patronage.

Snag Boats

A snag was a sunken tree trunk in the river that posed a serious hazard to navigation. Not surprisingly, snags were a major cause of shipwrecks. A fast traveling steamboat could drive upon these submerged snags and be impaled with terrible results. In order to reduce the dangers, Henry M. Shreve invented the snag boat. This second innovation of the resourceful river Captain made it possible to clear the Mississippi, and eventually other rivers, of these dangerous obstacles. Shreve's patent drawing of his catamaran snag boat *Heliopolis*, built in 1829, shows how the boat could be used to break off and remove trees along the bankline before they became completely submerged (Figure 73). The *Heliopolis* was used to clear some 300 miles of the Mississippi River of logs and other dangerous snags (Bass 1996:196). The river, however, is a dynamic force with an ever-changing course, and thousands of trees each year enter the river system. Consequently, clearing snags is a never-ending task (Figure 74).

Vernacular Watercraft

In addition to keelboats and flatboats, other small craft plied the river as short-distance transports. These vessels moved between vessels, from shore to shore, and from vessels to shore in the busy New Orleans port. The most common type of these small craft was the New Orleans lugger. Luggers, both small and large, made up the majority of small sailing vessels on the river in New Orleans.

The smaller versions of luggers were undecked with a single mast that carried a single lug sail (Figure 75). These fore and aft rigged vessels sailed very close to the wind, a necessity when sailing on a river with a strong current. They carried either a number of passengers or light cargoes. Larger versions of this craft carried two masts and jib sails (Figure 76). Some even carried lugger-rigged topsails. These large, multi-rigged luggers, however, were not strictly river craft, and more frequently sailed the Gulf of Mexico.

Like luggers, small brigantines also sailed the river, but were less common than luggers (Figure 77). Like the larger luggers, brigantines were most likely involved in coastal trade. These two vernacular craft could be seen along the Mississippi River throughout the nineteenth century, along with the common Louisiana skiff (Figure 78). Skiffs, still seen today, are small, oar-driven craft similar to a pirogue. However, they usually were constructed from lumber rather than a single log. The small, light, and easy to maneuver skiffs proved to be very versatile craft, and often were attached to river vessels as tenders.

Seagoing Craft

Throughout the colonial period, the preponderance of traffic in New Orleans consisted of seagoing vessels designed to support the colonial efforts. These sloops, brigs, cutters, frigates, and many similar vessel types were designed to transport people and cargo to and around the Atlantic World. As that world grew, and trade increased among the many ports of the Caribbean, South America, Central America, and the North American colonies, these ships evolved to handle the increased cargo demands. While trade up the river was conducted during the French period, as trappers and fur traders conveyed their wares from Louisiana to Canada, river traffic in the Spanish period was rather limited.

It is curious that most recent historical documentations of colonial watercraft along the coast of Louisiana have omitted any mention of slave ships. The first ship fitted out specifically to import slaves to the Louisiana colony was *Le Duc du Maine*, which arrived in 1719 with 250 men, women and children from the port of Juda (Whyda), on the "slave coast" (Hall 1992:63). Although records do not indicate what type of ship it was, officials from the Company of the Indies, who ran the colony of Louisiana by that time, estimated the ship could carry 500-600 slaves. It may have been a large frigate specially adapted for traffic in humans. Over the next 12 years, 22 slave ships arrived in Louisiana, bringing almost 6,000 slaves to the "New World" (Hall 1992:59-60).

After the Louisiana Purchase, the oceanic traffic in the Port of New Orleans changed in

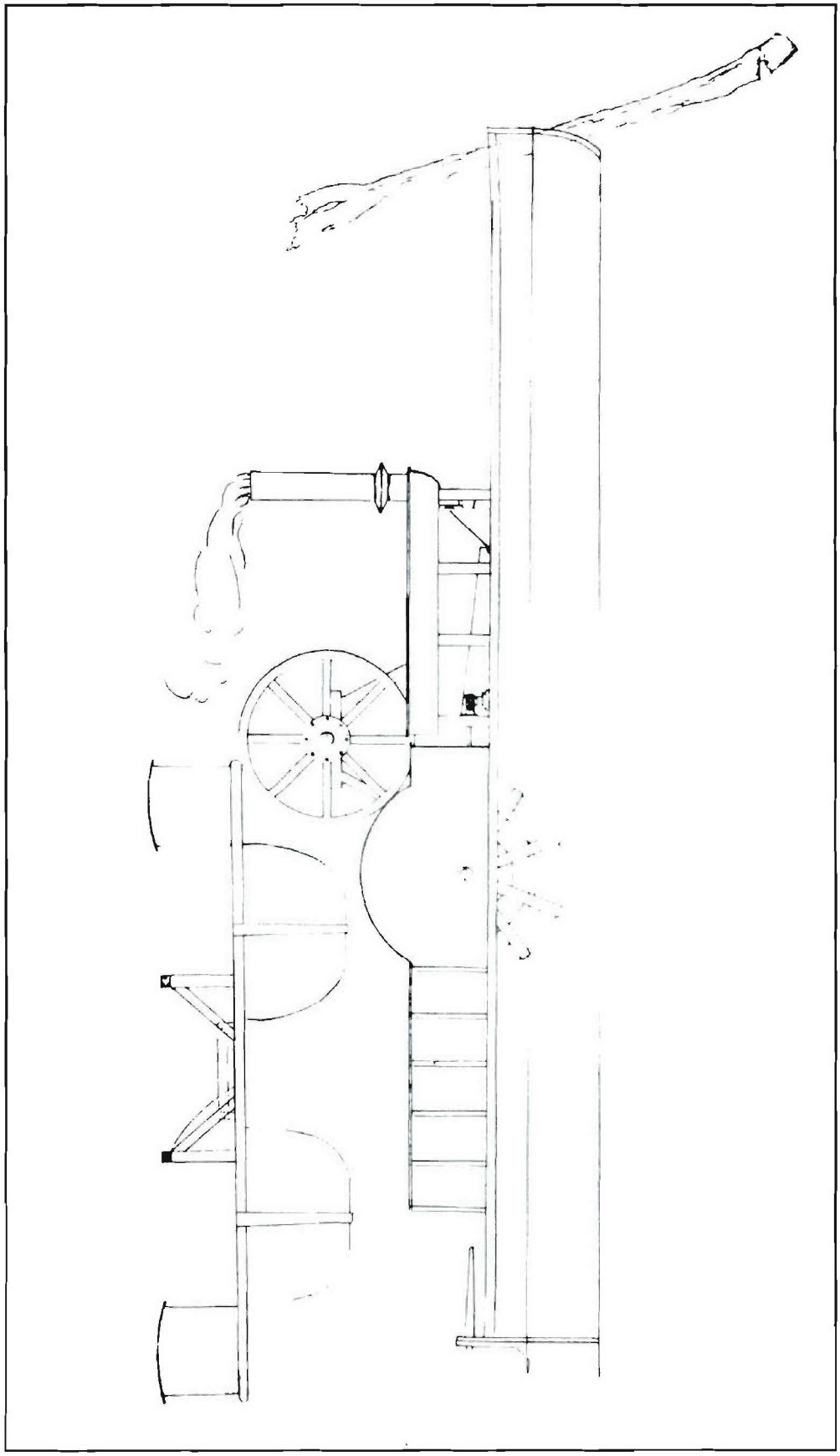


Figure 73. Henry Shreve deigned the snagboat *Heliopolis* in 1829. In this patent drawing, the catamaran hull and side paddlewheel can be seen (Excerpted from Bass 1996).

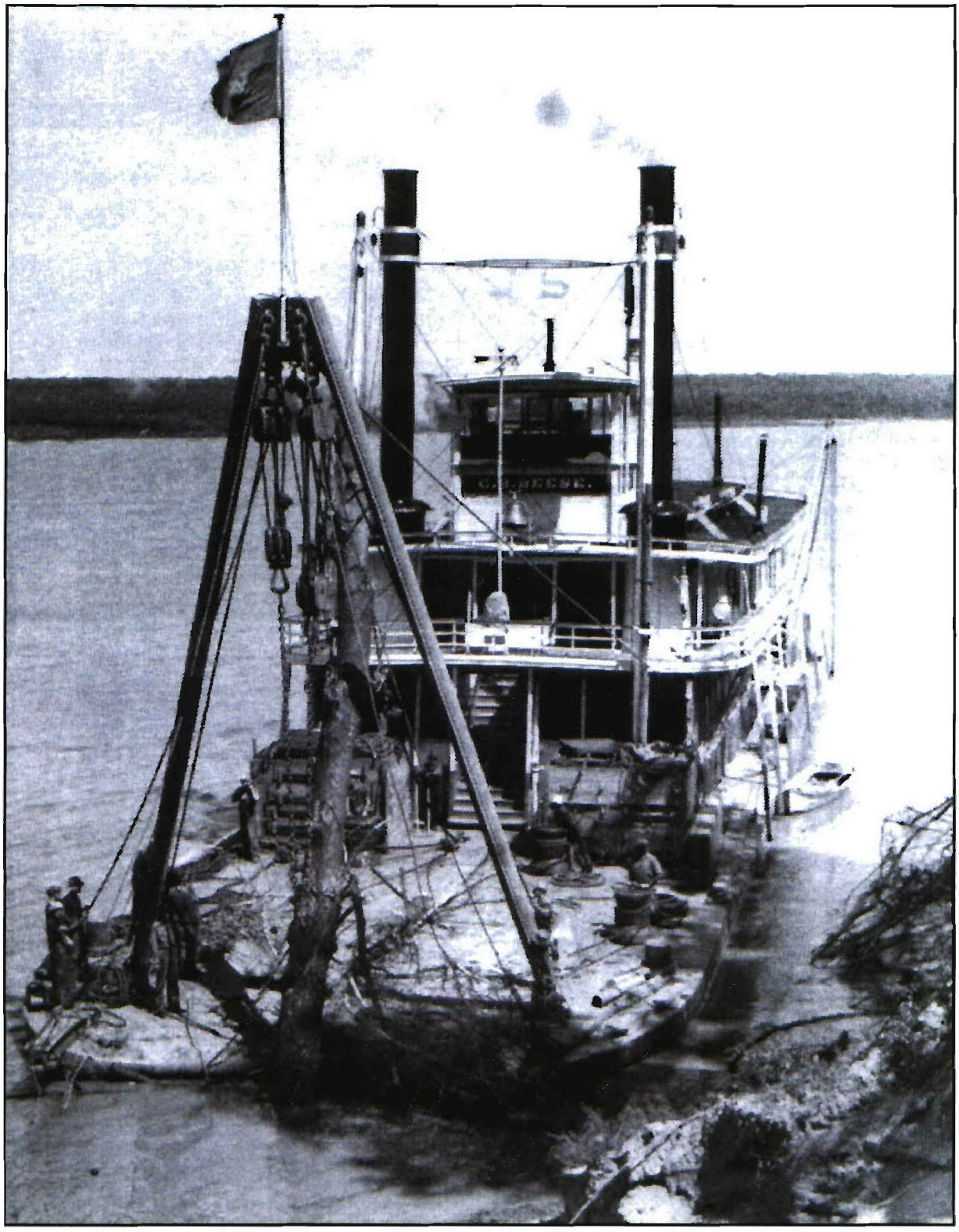


Figure 74. **Photograph of a relatively small snagboat removing a submerged tree from the bank of the river. Note the small skiff tied off on the port side (Clay 1976).**



Figure 75. **This drawing, excerpted from Terrell (1990) depicts a small New Orleans lugger. Generally, these vessels were undecked craft, flying a single mast that carried a lug sail. Rigged fore and aft, these vessels could sail very close to the wind, a necessity when sailing on a river with a strong current (excerpted from Terrell 1990).**



Figure 76. **In this section of Bachman's "Bird's Eye View of New Orleans," several large New Orleans luggers can be seen, carrying two masts and jib sails. Some even carried lugger-rigged topsails (Bachman 1851, courtesy of the Library of Congress).**



Figure 77. **This excerpt from Bachman's "Bird's eye View of New Orleans," depicts a brigantine at mid-century. These vessels were less common on the river than luggers, but they were able to sail both the ocean and the river (Bachman 1851, courtesy of the Library of Congress).**



Figure 78. **The Louisiana Skiff was a small rowed craft like the pirogue but more complicated architecturally. They were used for a thousand and one different purposes and often were attached to river vessels as tenders (Terrell 1990).**

type and character. According to the Louisiana Submerged Cultural Resource Management Plan (Terrell 1990:23), "American sailing ships reached their most massive sizes during the 19th century[, as] hull size increased and the vessels carried more area and combinations of sail." These American vessels were designed primarily to ply the waters of the Atlantic seaboard. With the advent of steam technology, many of these ships converted to steam, or to a combination of steam and sail propulsion.

By the dawn of the twentieth century, Asia, South America, and the Middle East became primary routes for the import/export trade of the Port of New Orleans. Bulk cargo vessels grew in size and tonnage in order to accommodate this commerce. Although railroad commerce eclipsed marine cargo transportation at the end of the nineteenth century, by the early twentieth century, the two means of transportation became integrated. The advent of containers in the 1970s made intermodal cargo shipping possible, recasting the focus of the Port of New Orleans yet again.

The seagoing vessels that called at the Port of New Orleans included every type of craft that sailed on the Atlantic, Caribbean, and Gulf of Mexico from the time of the city's founding in 1718 to the present. Consequently, only the most common of these vessels are discussed in the following section; however, variations of every vessel type also existed. Table 9 depicts the seagoing vessels noted in this chapter, including their size ranges and defining characteristics.

Table 9. Typology of Seagoing Vessels in the Port of New Orleans (compiled from various sources, see text).

Vessel Type	Length Range (ft)	Beam Range (ft)	Depth Range (ft)	Gross Tonnage Range	Propulsion	Defining Characteristics
Seagoing Craft						
Bark	60' to 320'	16' to 38'	8' to 20'	40 to 6,000	Sail	All masts square-rigged except the aft most rigged fore and aft
Ship	60' to 290'	16' to 38'	8' to 25'	40 to 4,000	Sail	All masts square-rigged
Pink	40' to 120'	12' to 32'	8' to 18'	20 to 1,000	Sail	Sharp, rounded stern
Sloop	25' to 100'	7' to 28'	5' to 8'	25 to 800	Sail	Single mast
Frigate	60' to 290'	15' to 38'	8' to 25'	40 to 4,000	Sail	Large stout hull
Ketch	40' to 100'	12' to 28'	8' to 16'	20 to 80	Sail	Mizzen mast stepped far aft
Brig	40' to 100'	12' to 28'	8' to 16'	30 to 150	Sail	Two square-rigged masts with a gaff spanker sail on mainmast
Snow	40' to 100'	12' to 28'	8' to 16'	30 to 150	Sail	Trysail mast aft of the main mast
Brigantine	40' to 100'	12' to 28'	8' to 16'	30 to 150	Sail	Square-rigged foremast with a fore and aft rigged mainmast
Cutter	25' to 60'	7' to 15'	5' to 8'	15 to 40	Sail	Single mast
Barkentine	60' to 289'	15' to 40'	8' to 25'	40 to 2,000	Sail	Square-rigged foremast with other masts rigged fore and aft
Schooner	40' ' to 369.5'	12' to 50'	8' to 26'	30 to 5,000	Sail	All masts rigged fore and aft
Lugger	40' to 100'	12' to 28'	8' to 16'	30 to 150	Sail	Lugg rigged sails
Steamship	31' to 398'	11' to 45'	3' to 29'	15' to 1,422	Steam engine	Steam engine
Freighter	120' to 450'	21' to 70'	20' to 30'	200' to 450'	Steam/fuel oil/diesel	Loading cranes
Tanker	331' to 1,089'	40' to 190'	20' to 50'	6,000 to 400,000	Steam/fuel oil/diesel	Deck piping
Container Ship	277' to 687'	50' to 100'	18' to 50'	3,364 to 54,000	Steam/fuel oil/diesel	Deck load of containers

Bark

This vessel type endured for centuries, although barks underwent considerable change over the course of that time span. During the sixteenth century, the English *bark* was similar in construction to the French *nef*, which itself was another variation of the Spanish *nao*. When classification by rig configuration became common, barks became associated with three masted vessels. The first two masts were square-rigged, with no square sails on the mizzenmast. By the late nineteenth and early twentieth-centuries, the bark had evolved into a vessel of up to five masts, with all masts square-rigged save the aft-most, which was rigged fore and aft (Figure 79).

Ship

A ship generally is referred to as a three masted, square-rigged vessel. These constituted the largest of the merchant vessels until the late nineteenth and twentieth centuries. Most ships were complex and square-rigged vessels, and they eventually were replaced by fore and aft rigged vessels, such as schooners, barkentines, and ketches (Figure 80). Ships ranged in size from 18.3 to 88.4 m (60 to 100 ft), and served as the "work horses" of colonial and early American cargo needs. The massive square-riggers carried a payload of up to 4,000 tons.

Pink

A pink resembled a *fluyt*, a Dutch vessel characterized by a sharp, rounded stern. Pinks most often were fitted with a square rig, and could be operated by a small crew, reducing freight costs. They generally were considered middle-sized vessels, capable of crossing the Atlantic, but with far less cargo room than barks, ships, or frigates. They ranged in length from 12.2 to 36.6 m (40 to 120 ft).

Sloop

Sloops refer to small, single masted merchant or fishing vessels. Sloops proliferated throughout the nineteenth century. As a result, they carried a large amount of coastal trade, especially to and from ports not easily accessible by deep-water vessels. Sloops usually were rigged fore and aft, though they could be rigged with one or two square sails as well (Figure 81).

Frigate

This ship classification refers to a type of hull, rather than to a type of rig. The term "frigate" was used to describe both a type of merchant vessel and a fast, maneuverable, and comparatively light warship from the late seventeenth to early nineteenth centuries. Frigates were distinguished by low profile hulls, single flush gun decks, square sterns, quarter galleries, and full heads (Gardiner 1992:72). Many frigates were rigged as slave ships during the eighteenth and nineteenth centuries (Figures 82 and 83).

Ketch

These vessels most often served as yachts for carrying important persons, although some were used as merchant vessels. Their great beam and ample room before the mainmast also made them ideal for mounting mortars, hence the term "bomb-ketch" (Smyth 1996:420). These vessels could be up to 30.5 m (100 ft) in length, but carried very little tonnage compared to either frigates or schooners.

Brig

Brigs were two masted vessels rigged with square sails on both masts, as well as a secondary fore and aft gaff sail on the main mast. The average tonnage of the 768 new brigs registered in Newcastle between 1786 and 1800 was 177 tons (Gardiner 1992:27). A variation of the brig was the hermaphrodite brig, also sometimes known as a brig-schooner rig, whose mainmast carried a gaff-rigged mainsail with a single, smaller square sail set above.

Snow

A snow closely resembled a brig. It generally carried two masts, which were square-rigged like the brig. However, instead of mounting the gaff sail on the mainmast, the snow carried an independent snow mast abaft the main mast that carried the gaff rig (Tryckare 1963:76). These vessels were relatively small in length (12.2 to 30.5 m [40 to 100 ft]), and were not able to carry large cargoes.

Brigantine

The brigantine [bergantine] sported two masts: a square-rigged foremast, and a fore and

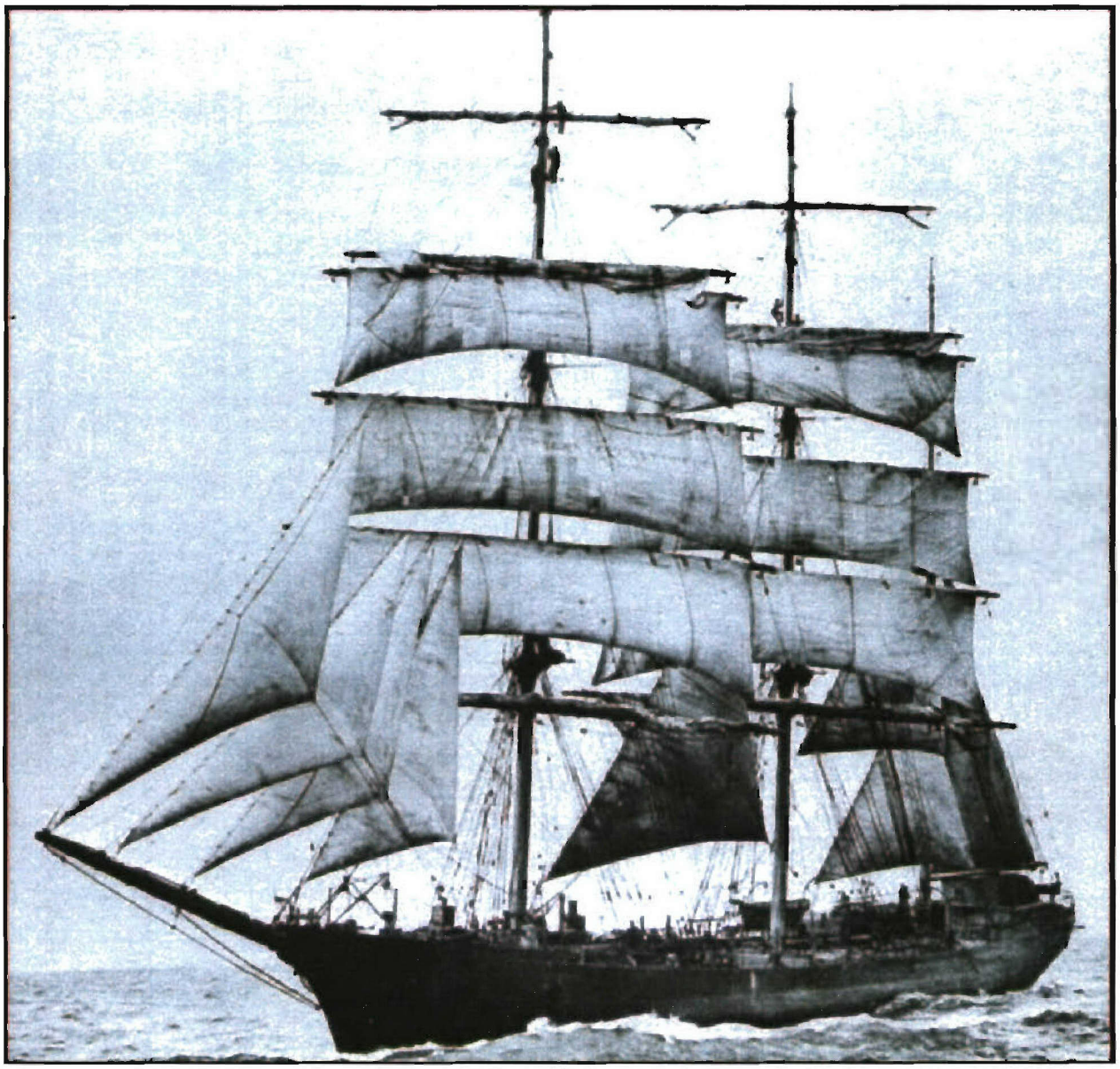


Figure 79. **This undated photograph depicts the steel bark, *Kiaulani,* built in Bath, Maine in 1899 (excerpted from Albion et al. 1972).**

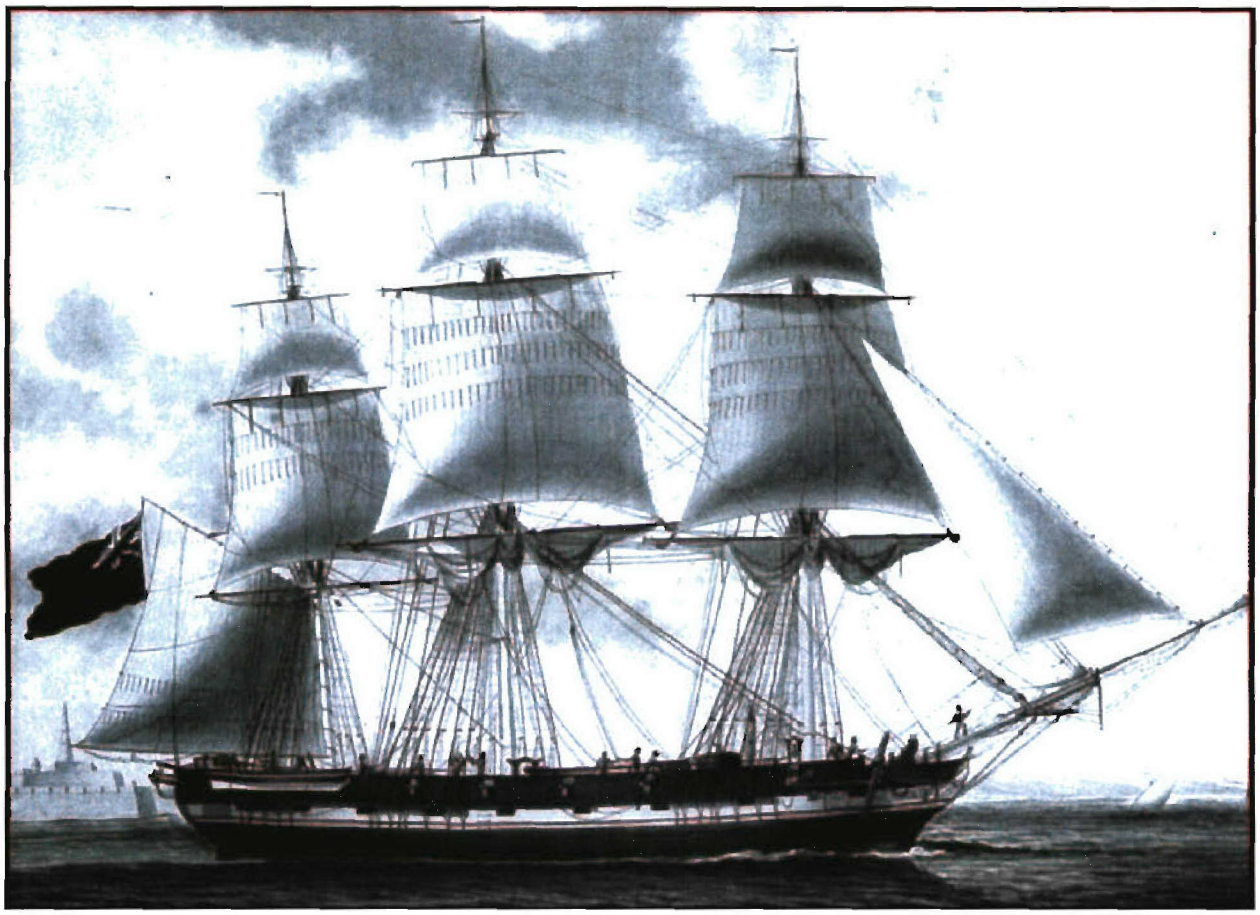


Figure 80. **This illustration portrays the ship, *Harriet,* from in 1815. The vessel is flying a flag of one of the British colonies (excerpted from Gardiner 1992).**

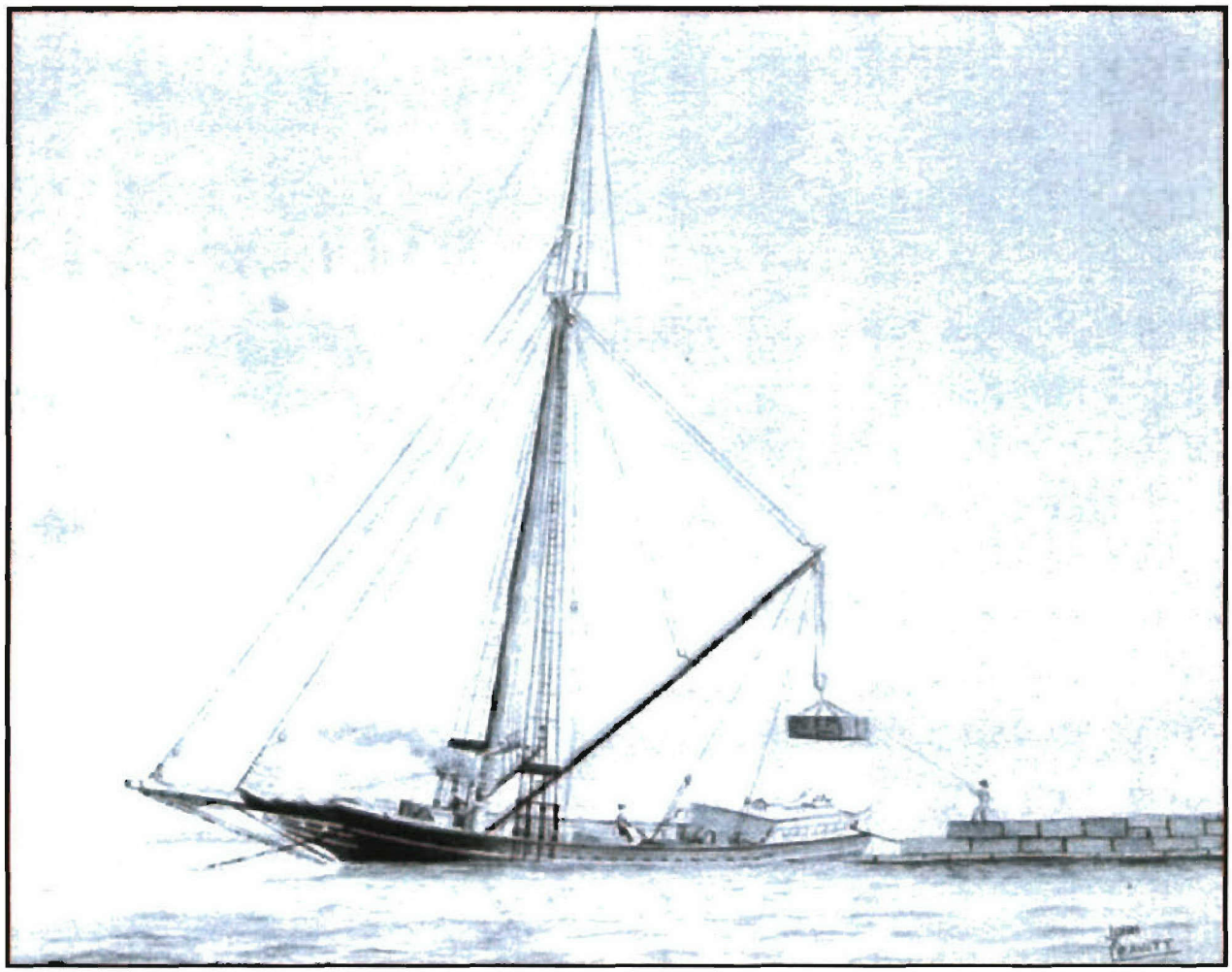


Figure 81. **This painting depicts a sloop unloading stone, by utilizing her main boom as a derrick (excerpted from Albion et al. 1972).**

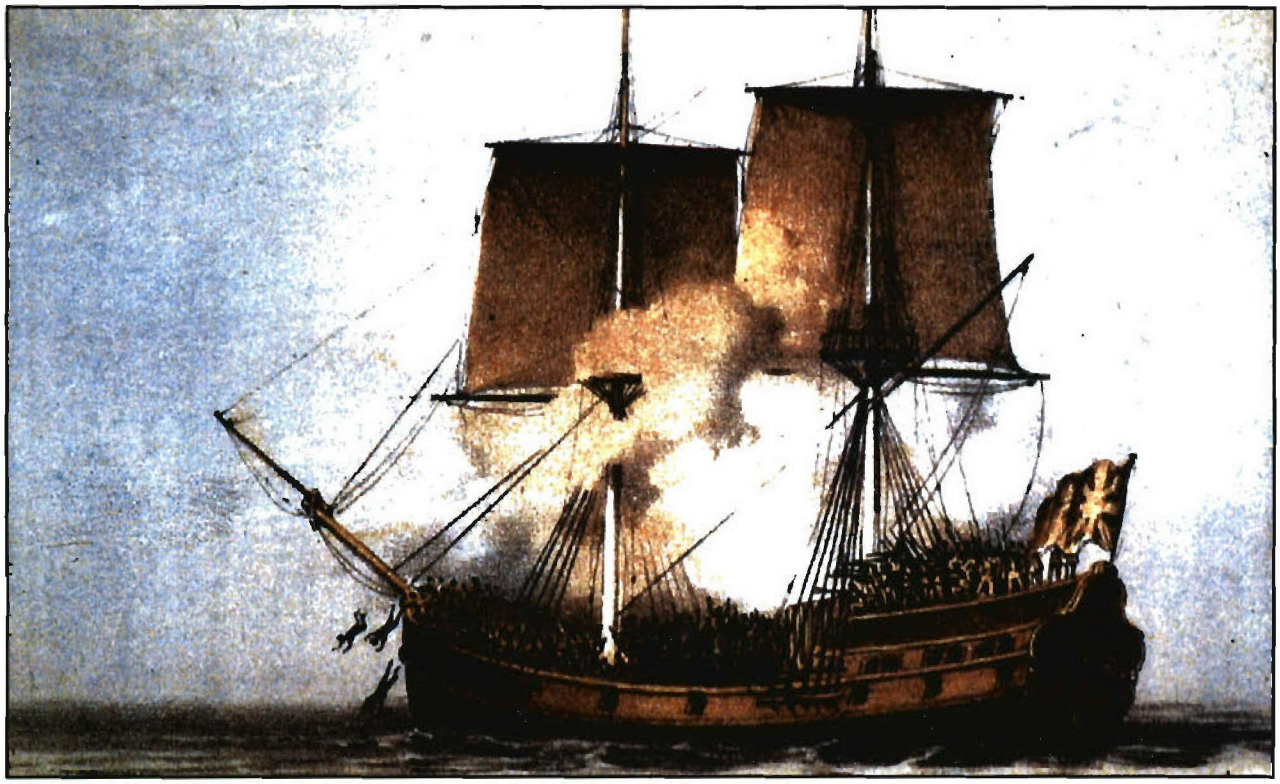


Figure 82. **This William Fox painting, *Revolt Aboard Slave Ship* [1787], shows an insurrection aboard a frigate adapted for the slave trade, (excerpted from A Brief History of the Wesleyan Missions on the West Coast of Africa [London, 1851]).**

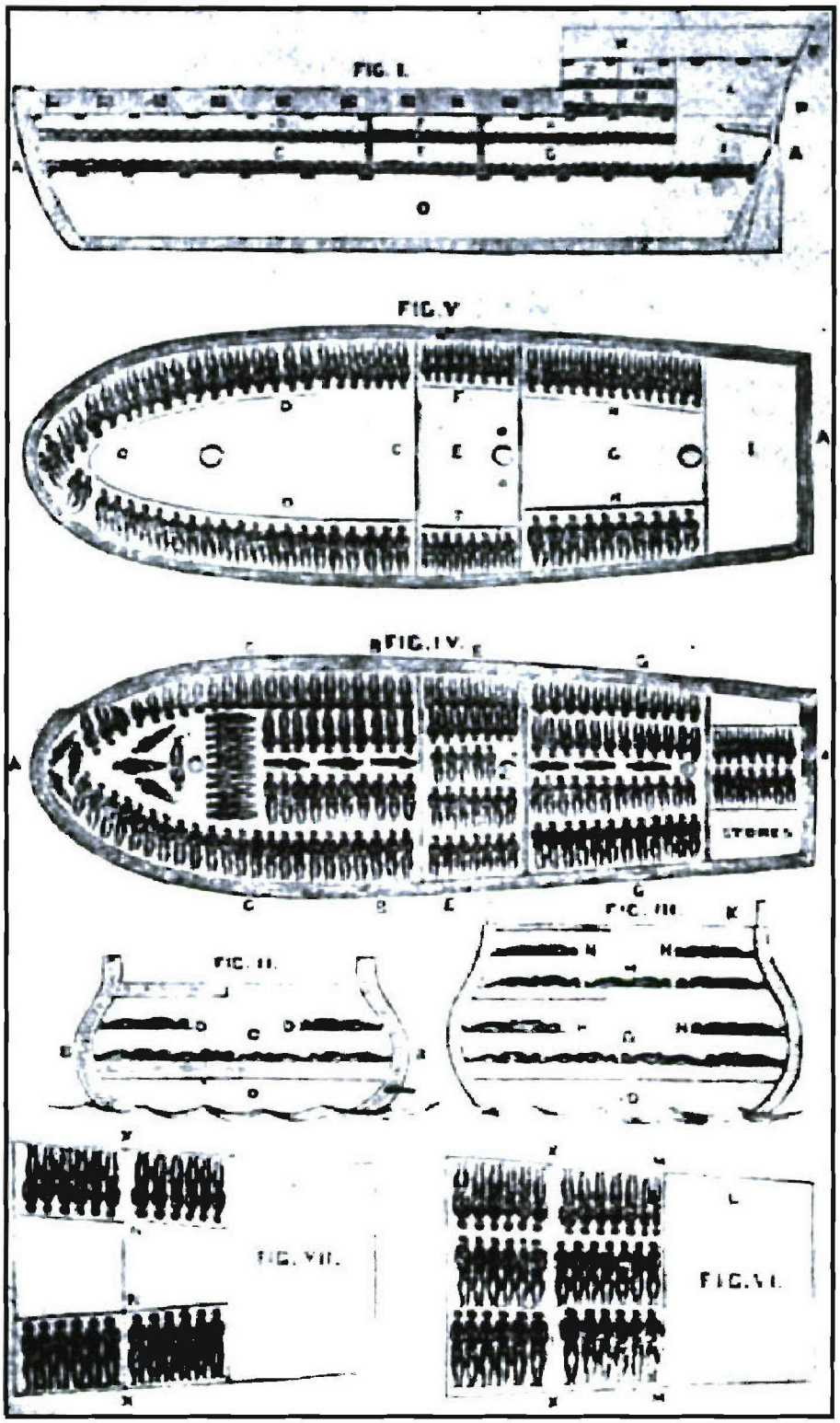


Figure 83. **This sketch of the "British Slave Ship Brookes" [1789], depicts the design features particular to a slave ship (excerpted from the Broadside collection, Rare Book and Special Collections Division, Library of Congress [Portfolio 282-43]).**

aft rigged mainmast. These ships were typified by open, flat-bottomed hulls, and could carry as many as 100 voyagers (Pearson et al. 1989:76). These vessels commonly worked in coastal trade, since they were smaller than many other masted ships, such as barkentines and schooners. Brigantines were common around the Atlantic World throughout the sixteenth and seventeenth centuries, and were similar in hull design to Spanish caravals or caravels. Hernando de Soto's historic voyage to the new world was conducted on seven brigantines.

Barkentine

The barkentine essentially represented a larger version of the brigantine. It carried between three and six masts. Mast configuration consisted of a square-rigged foremast, while the remaining masts were fore and aft rigged. On a six masted barkentine, the masts were designated as foremast, mainmast, mizzenmast, jiggermast, driver mast, and spanker mast (Tryckare 1963:74).

Schooner

The schooner appeared during the eighteenth century but exploded in popularity during the nineteenth century. Schooners became popular because they were inexpensive to build, crew, and operate. It has been argued by some that the appearance of the schooner represents one of the greatest advances in the development of sailing rigs since the appearance of the three-masted ship during the fifteenth century (Gardiner 1992:27). Schooner masts always were rigged fore and aft, although some carried square topsails. Schooners' masts were of equivalent height. By the late nineteenth and early twentieth centuries, some schooners carried as many as seven masts (Figure 84).

Cutter

A single mast and sharp-built, broad hull characterized cutters. Rigged fore and aft, these vessels carried a great deal of sail for their size. This made them especially useful as revenue vessels, since the fore and aft rig allowed them to point well into the wind. The large sail area made them very fast and capable of over-hauling other vessels. Some cutters also were used to carry cargoes (Smyth 1996:229).

Lugger

Luggers carried one or two masts rigged with lugsails, which resembled lateen sails with the leading corner truncated. Fishermen and coastal merchants used luggers, as they found that these small crafts tolerated weather better than square-riggers. These vessels had shallow-draft hulls, designed to take advantage of tidal movement (Kemp 1976:502). Generally, luggers were built locally, and used to fish and carry cargo along the coastal waters.

Steamship

Steamships operated by converting coal, and later other fuels, into steam, which in turn powered the vessel engine. When this steam machinery first evolved, it often was combined with a sailing rig as a precaution, in case of mechanical failure, or to conserve coal when a good wind could be used. Oceangoing steamships utilized a side paddlewheel for propulsion. Screw propellers replaced side-wheels during the second half of the nineteenth century (Figure 85).

Freighter

During the very late nineteenth and early twentieth centuries, a bulk cargo-carrying vessel developed that was completely independent of wind power. Freighters utilized screw propellers; they were typified by a rectangular-shaped iron hull. The increased power produced by the screw made such an awkward and bulky hull configuration viable. Freighters proliferated throughout the early twentieth century, and continue to operate in large numbers today.

Tanker

Tankers are specialized vessels used to transport liquids, especially fuels like gasoline, jet A, or oil in various stages of refinement. Like freighters, they have essentially rectangular hulls, with shaped bow and stern for cutting the water. In the late twentieth century, the supertanker evolved as a variation on the tanker. These vessels have enormous carrying capacity, making them very economical to operate; however, when a sinking or grounding event occurs, the damage caused by the discharge of millions of gallons of fuel can devastate the marine envi-

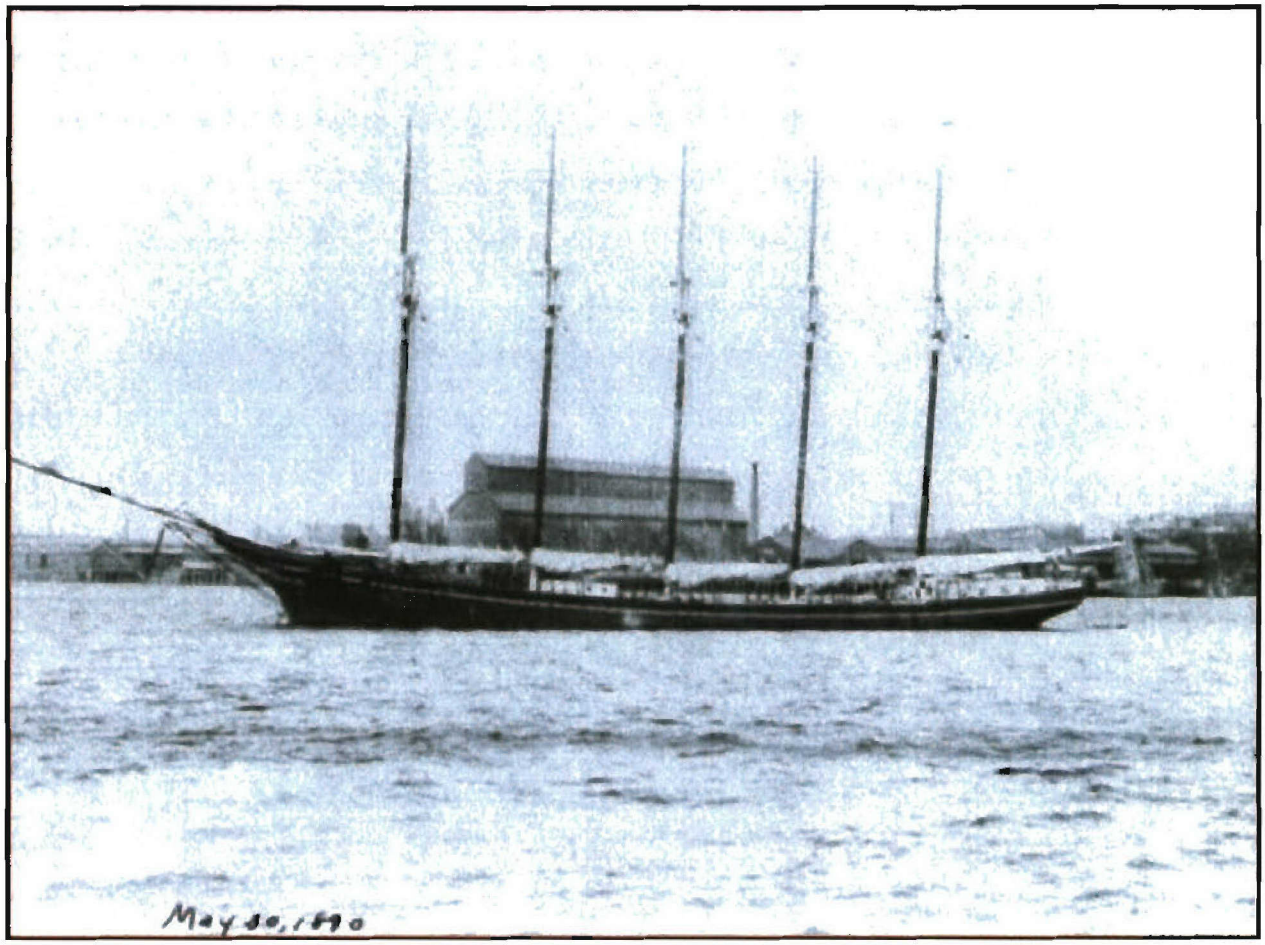


Figure 84. **This photograph, dated May 30, 1890, depicts the five-masted schooner, *Governor Ames,* built at Waldoboro, Maine in 1888 (excerpted from Albion et al. 1972).**

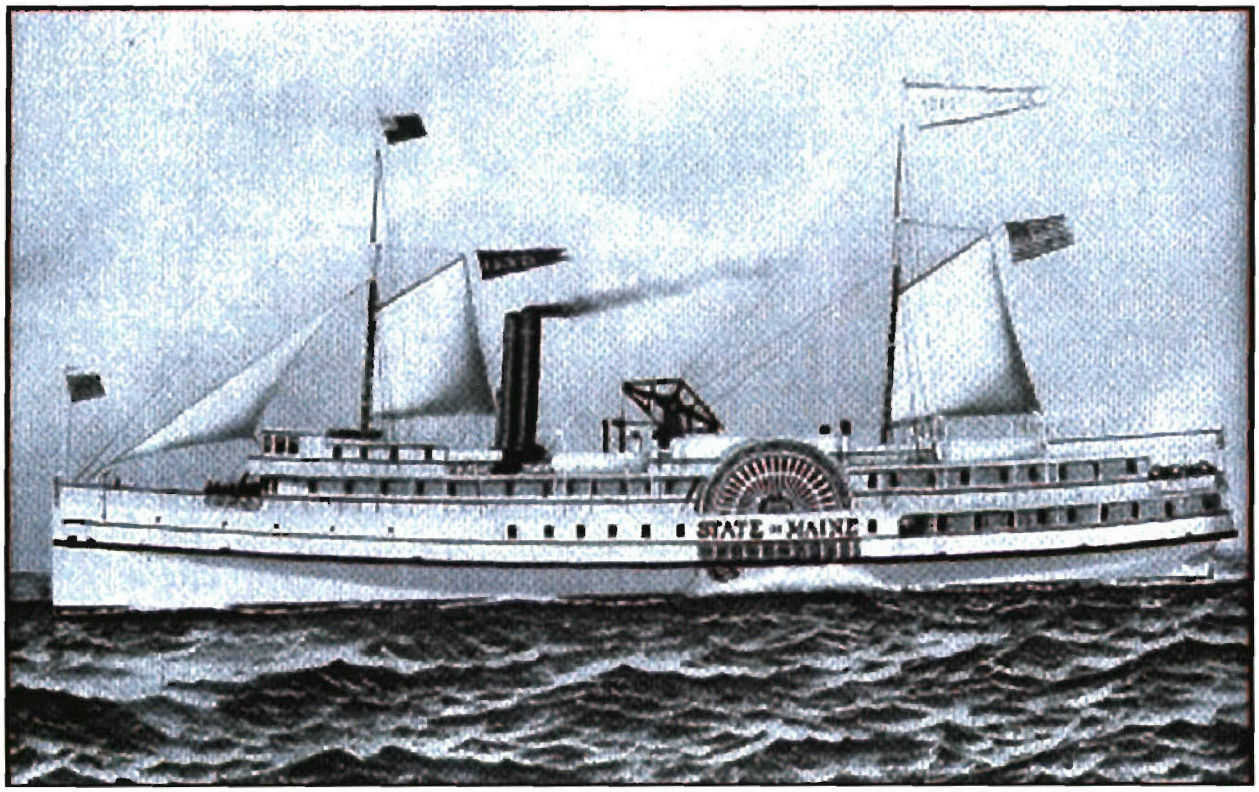


Figure 85. **This drawing illustrates the side-wheel steamer, *State of Maine,* built in 1881 at Bath, Maine (excerpted from Albion et al. 1972).**

ronment. Supertankers are too large to sail the river, and thus remain outside the Port of New Orleans. Generally, smaller, lightering tankers offload the supertankers and carry their cargoes upriver, or the supertankers use the Louisiana Offshore Oil Port (Loop), located in the Gulf of Mexico.

Container Ship

This modern vessel type is a specialized freighter designed for optimal packing of shipping containers for unloading at ports. It transports containers that can be directly loaded onto tractor-trailer trucks or railroad cars for movement by highway or rail. These have become the preferred vessel-type, used by most seafaring nations since the 1970s. This "containerization revolution" dramatically increased port efficiency.

The Working Craft of New Orleans

The evolution of New Orleans as a port necessitated a large number of workboats to handle the short-term, local transportation needs in the vicinity. A remarkable number of different watercraft, both small and large, has serviced New Orleans' maritime and riverine commerce. Historically, a great majority of these transport craft were used to ship cargo from one point to another, but as port facilities on the river increased during the eighteenth and nineteenth centuries, a number became utilitarian in nature. These vessels were used for specific purposes, such as pile driving, floating wharves, or housing.

The ancestors of modern day gravel, petroleum, or deck barges are a class of vessels collectively known as scows, a word derived from the Dutch "*schouw.*" This term originally was used to describe a craft with a flat-bottomed, square-ended hull. In the context of New Orleans and the Mississippi River, a large number of craft fall into this category, including radeaux, flats, chalands (French) or Chalans (Spanish), flatboats, broadhorns, Kentucky Arks, New Orleans boats, Susquehanna boats, barges, coal flats, fuel boats, coal barges, coalboats, guipers, cotton boxes, and cracker boxes. Like the Dutch "*schouw,*" these American river craft all had flat bottoms; however, they differ from their European relatives, since they might have had raked as well as square ends (Saltus 1995:2-45).

The nature of the river had a profound effect on the design of these craft. Essentially, any craft used to transport cargo is, to a large degree, simply a box. The environment in which the box operated largely determined the shape and design of each box. Though the Mississippi River might flood, or run very rapidly, it rarely has chop or swell of any significant nature. This permits very simple hull designs that, in many cases, resemble boxes. This ease in design also kept the cost of design and construction of scow craft relatively inexpensive (Steffy 1994: 10).

The hull design of barges, however, made the vessels unwieldy in the treacherous river currents. Consequently, following the creation of these extremely large cargo vessels, tugboats were adapted for use with barges. Historically, tugboats and ferries were the most common vessels berthed in the project area. The nature and commerce of the ferry, towboat, salvage, and coal businesses associated with the project area throughout the twentieth century utilized a large variety of different vessel types. The following section describes these port-related workboats. Table 10 illustrates the types and sizes of workboats found in the Port of New Orleans, as well as their defining characteristics.

Barges

Broadly speaking, barges may be divided into two distinct groups: barges that carry liquid cargoes, and barges that carry solid cargoes or equipment. Many barges consisted simply of the salvaged hulls of other vessels. Tanker and non-tanker barges are briefly identified below.

Tanker Barges

The first group of barges generally are classified as tanker barges, which includes water barges such as the *John S. Lanier* (see Chapter VIII), fuel or petroleum barges, liquid chemical carriers, etc. Generally speaking, most barges refer to "dumb barges." These barges have no power or means to move in the water without the assistance of a tug or pushboat, or by pulling on lines secured to docks, vessels, or other barges.

Table 10. Typology of Work Vessels in the Port of New Orleans.

Vessel Type	Length Range (ft)	Beam Range (ft)	Depth Range (ft)	Gross Tonnage Range	Propulsion	Defining Characteristics
Working Craft						
Tanker Barge	40' to 120'	10' to 30'	4' to 10'	200 to 1000	Not Powered	Deck valves and piping
Hopper Barge	60' to 140'	20' to 26'	5' to 10'	300 to 1500	Not Powered	Open hull
Deck Barge	40' to 230'	10' to 50'	5' to 10'	100 to 2500	Not Powered	No interior cargo capacity
Derrick Barge	20' to 150'	10' to 50'	5' to 10'	N/A	Not Powered	Derrick structure
Spud Barge	40' to 200'	20' to 40'	4' to 10'	300 to 1500	Diesel	Long vertical spuds
Side-wheel Towboat	75' to 190'	15' to 38'	2.5' to 9'	46 to 150	Steam/fuel oil	Side-wheels
Screw Propeller Towboat	60' to 150'	15' to 30'	7' to 10'	40 to 125	Steam/fuel oil/diesel	Small size
Pushboat	30' to 150'	12' to 30'	3' to 10'	10 to 125	Steam/fuel oil/diesel	Flat specialized bow
Dredge	24' to 150'	10' to 30'	2' to 10'	N/A	Steam/fuel oil/diesel	Large deck structure and slurry piping
Wharfboat	60' to 335'	20' to 51'	2' to 9.5'	100 to 800	Steam/fuel oil/diesel	Re-used hull
Ferryboat	30' to 136'	15' to 60'	5' to 12'	.5 to 250	Steam/fuel oil/diesel	Open deck space for carrigages or cars
Railroad Ferry	200' to 250'	50' to 60'	9' to 12'	190 to 220	Steam/fuel oil/diesel	Flying bridge structure and tracks
Coal Transfer	100' to 130'	30' to 40'	7' to 10'	N/A	Not Powerd	Tower structure

Fuel barges increased in number and importance as coal and wood burning steamships began the conversion to fuel oil. A rare collection of undated photographs, owned by the William A. Bisso, III family, shows the construction of *U. S. Oil Barge No. 11*, possibly in the current project area. The first figure shows some of the detail of the interior structure of this tanker barge (Figure 86). The barge was constructed of riveted iron, with interior bulkheading. Figure 87 depicts the barge in a near state of completion with the river behind it, and what appears to be a crane barge and a tower, either for pile driving or a coal conveyor, in the background. The same figure exhibits some of the deck fixtures, pumping controls, valves, and ports that are distinguishing characteristics of the tanker barge. The barge is supported on stocks that consist of individual milled timbers stacked together to provide sufficient support (Figure 88). Wooden ways (launching rails) lead down to the river for the sideways launching of the barge. The final photograph in the series shows the finished barge sliding down the ways into the river (Figure 89). It is interesting to note that over the time the barge was built and photographed, a substantial number of trees in the construction area were removed, perhaps indicating the use of local materials in the process of constructing the barge.

Non-tanker Barges

Two types of non-tanker barges exist: those with holds are known as hopper barges, while those without holds are called flatbeds, or deck barges. Barges have become the bulk carriers of choice on the river due to their low cost to operate and maintain. Non-tanker barges make up the great majority of barges in operation on the water today. Barges serve many purposes, and can be used in many different capacities. At times, barges have been used in an emergency to offload cargo from stricken or grounded steamers (Gandy and Gandy 1987:53). Some heavy bulk cargo carrying barges were so long they required hogging-trusses to prevent sagging, or were especially designed and reinforced in their centers to prevent hogging and buckling (Gandy and Gandy 1987:41).

Hopper Barges

A hopper barge refers to a barge that contained hold space within the hull. Often, these were open hoppers; however, hatch covers

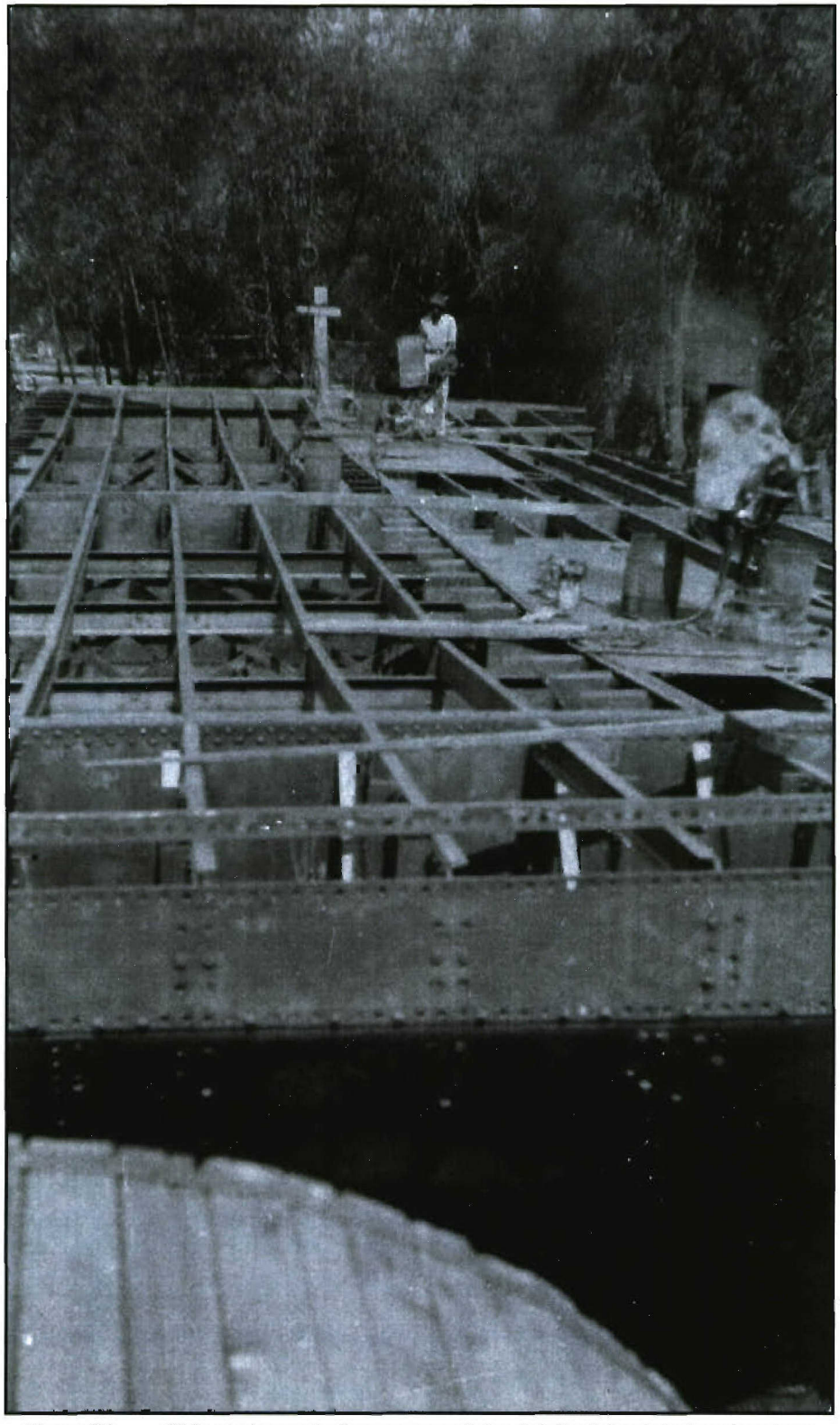


Figure 86. **This photograph shows some of the detail of the interior structure. The barge is constructed with riveted iron, and contains interior bulkheading (Photo courtesy William A. Bisso, III Historic Photograph Collection).**





Figure 87. **In this top photograph, the barge nearly completed along the riverside. What appears to be a crane barge and a tower, either for pile driving or a coal conveyor, can be seen in the background, probably on the river. The lower figure shows some of the deck fixtures, pumping controls, valves, and ports that are distinguishing characteristics of the tanker barge (Photos courtesy William A. Bisso, III Historic Photograph Collection).**

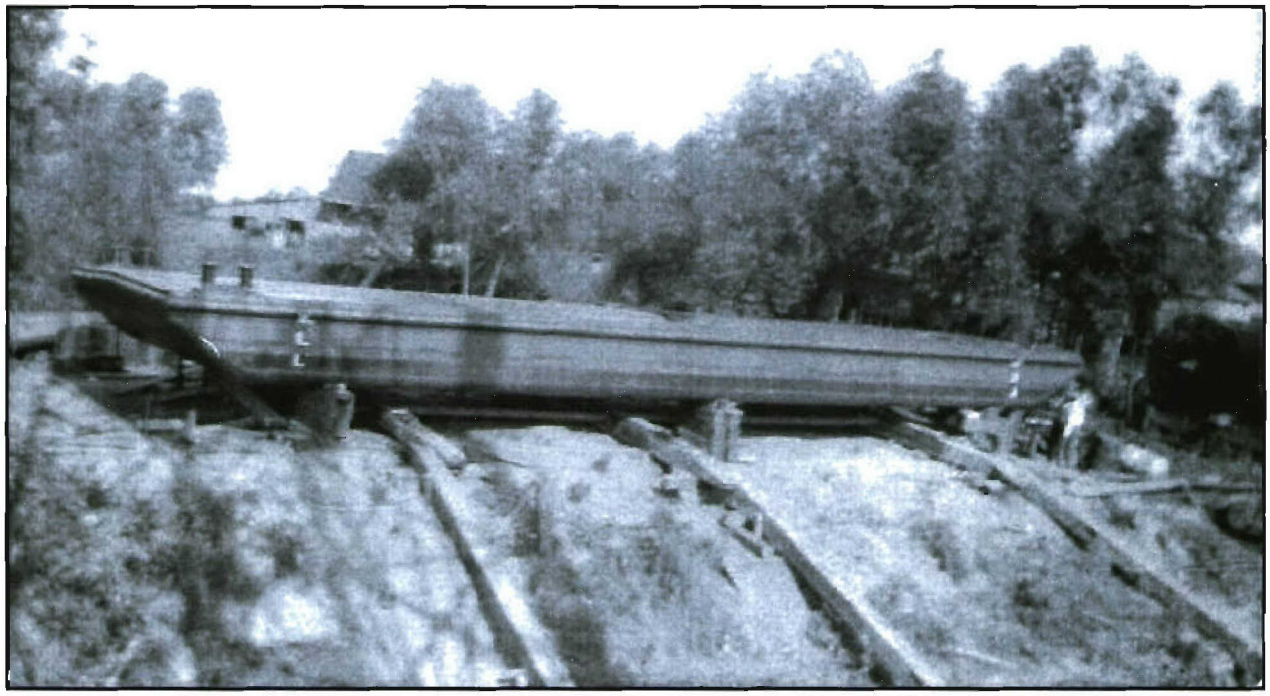


Figure 88. **This photograph from the private collection of William A. Bisso, III, depicts a barge on stocks preparing for launch. The stocks consisted of milled timbers stacked together to provide sufficient support. A wooden ways leads down to the river (Photo courtesy William A. Bisso, III Historic Photograph Collection).**



Figure 89. **The final photograph in the series depicts the finished barge sliding down the ways into the river. It is interesting to note that over the time the barge was built and photographed, a substantial number of trees in the construction area have been removed, perhaps to fuel the manufacturing process (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

were used for cargoes such as grain or salt that might be damaged by water. The Currier & Ives 1885 bird's eye view of New Orleans depicts several hopper barges on the west bank of the river (Figure 90). These vessels stretch along the shoreline, next to a number of steamboats loading wood for fuel. The combination of barges, woodpiles, and steamboats storing the wood suggests that these barges may have been involved in the wood trade. One of the barges has a long skull reminiscent of the sweeps used on flatboats.

Another excellent example of a hopper barge comes from the photographic collection of William A. Bisso, III. It depicts a long and deep coal-filled hopper barge, with stout athwartships timbers to prevent the sides of the barge from pulling apart under the cargo weight (Figure 91). An example of a hopper barge with more than one compartment or hold comes from a photograph of the side-wheel steamer *John A. Scudder*, of the Anchor Line. In the foreground of the photograph, a very long hopper barge with numerous holds is visible (Figure 92). This particular barge was so long that it required a hogging truss that can be seen arching over the barge supported by a number of angled stanchions.

Perhaps the most famous of the hopper barges was the Pittsburgh coal flat (also called a Pennsylvania coal flat), mentioned by Mark Twain as one of the last stops for keelboat men (Twain 1960:10; Figure 93). In this photo, the tug *W. W. O'Neil* appears to be setting up a tow of a large number of heavily-laden coal flats. These are single hopper barges with some degree of rake to their ends. Another photograph depicts four coal flats under a bridge. In this case, the rake of their ends is most distinct (Figure 94).

As the number of steamships on the river rose throughout the early nineteenth century, their appetite for coal gave rise to a great trade in that commodity, previously used mostly for the heating of homes. Large coaling yards were established in most ports, including New Orleans. As a result, the versatile barge was adapted for use as a bulk carrier, and occasionally as a storage facility, for coal. It is important to note that barges very often are known by a name based upon cargo or function. The afore-mentioned hopper barges are an excellent example. Although these were coal barges, not all coal barges were necessarily hopper barges.

Deck Barges

A deck barge refers to any barge that has a clear, flat deck. Essentially, they are the riverine equivalent of the flatbed truck. With such an open layout, such vessels serve a number of functions, from hauling, to storage, to derrick and crane support. An excellent example of another "coal barge" is *Deck Barge No. 19*, photographed in the early part of the twentieth century, in what may be the vicinity of the current project area (Figure 95). This is the same barge shown in a photograph with the *Addison E. Bullard*, which is discussed in Chapter VIII.

Sealed deck barges were capable of carrying a great volume of cargo as a result of the buoyancy provided by the air within the hull. Deck barges were sometimes used as temporary moorings, or tie-up docks, as was the case with the deck barge located behind the hopper barge in Figure 91 above. Deck barges also were used as temporary or long-term storage, as exemplified by Bisso Marine's *Barge No. 535* (Figure 96). This barge was used to store old steam machinery, smokestacks, and boilers, until it was lost in the 1977 *S. S. Sitala* collision. This use of deck barges by the various Bisso businesses within the project area also can be seen in an aerial photograph taken in the 1970s (Gandoifo, Kuhn & Associates ca. 1970s).

Deck barges frequently served as additional workspace or work platforms. This was the case with the deck barge *Gouldsboro* after its conversion from a railway ferry (Figure 97). According to William A. Bisso, III, the *Gouldsboro* was used as a temporary shipyard to re-power and rebuild a small tugboat (William A. Bisso, III, personal communication: 10/13/03). Barges also served as machine platforms, and were renamed based on their functions.

Derrick Barges

The term derrick barges simply refers to deck barges that have been configured and powered for heavy lifting. The role of this important class of vessel is often overlooked.



Figure 90. **In this excerpt from the 1885 Currier & Ives panorama "The City of New Orleans," hopper barges can be seen along the riverside on the West bank of the river. One of the barges has a long skull, very reminiscent of the sweeps used on flatboats (Currier & Ives 1885, courtesy of the Library of Congress).**



Figure 91. **This photograph portrays a long, deep, coal-filled hopper barge possibly in the vicinity of the current project area. Note the stout athwartships timbers, designed to prevent the sides of the barge from pulling apart due to the weight of the cargo (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

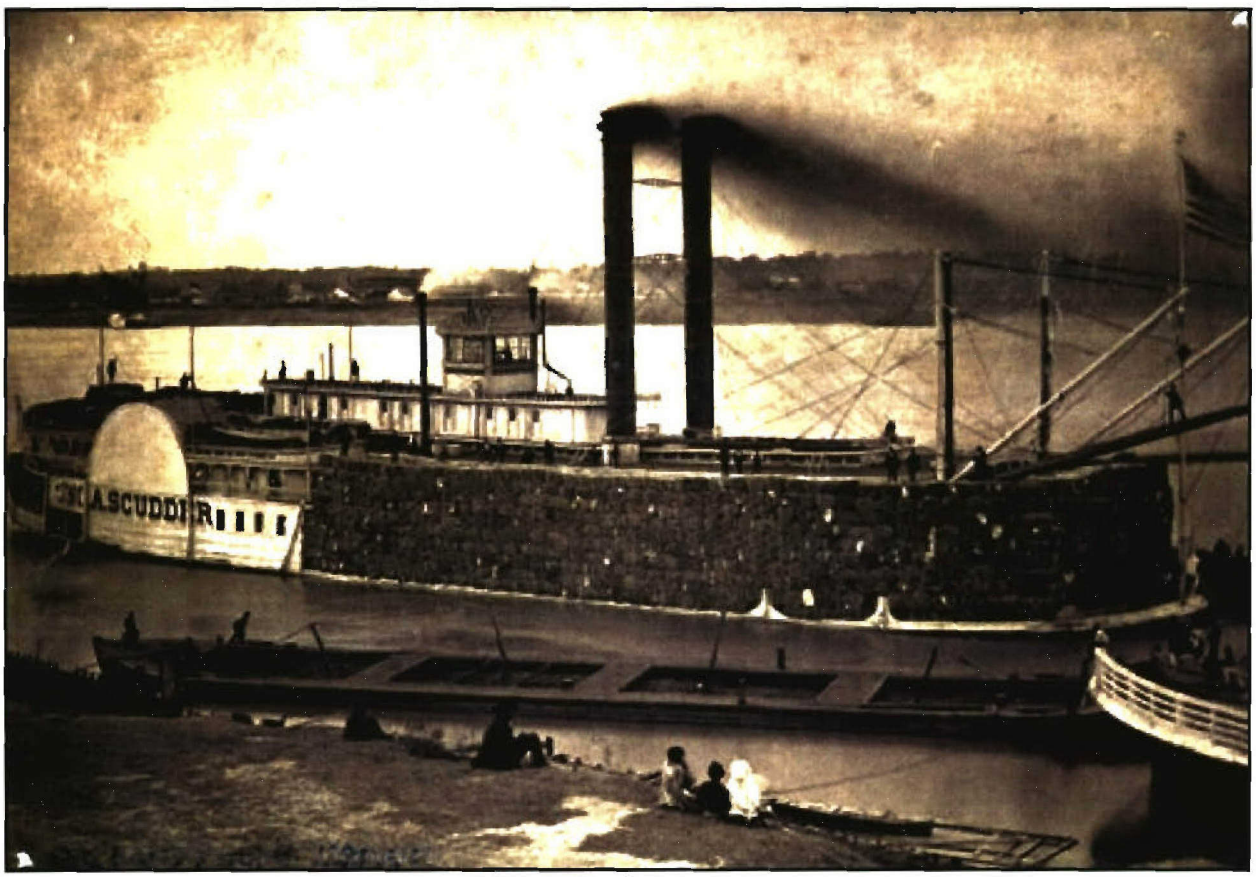


Figure 92. **This photograph depicts the side-wheel steamer *John A. Scudder* of the Anchor Line. The *Scudder* made the run from Cincinnati to New Orleans loaded with over 4,000 cotton bales. In the foreground of the photograph, a very long hopper barge with numerous compartments or holds can be seen. This particular barge was so long that it required a hogging truss, which can be seen arching over the barge supported by a number of angled stanchions (Photo courtesy of the Orleans Parish Public Library, Louisiana Division).**

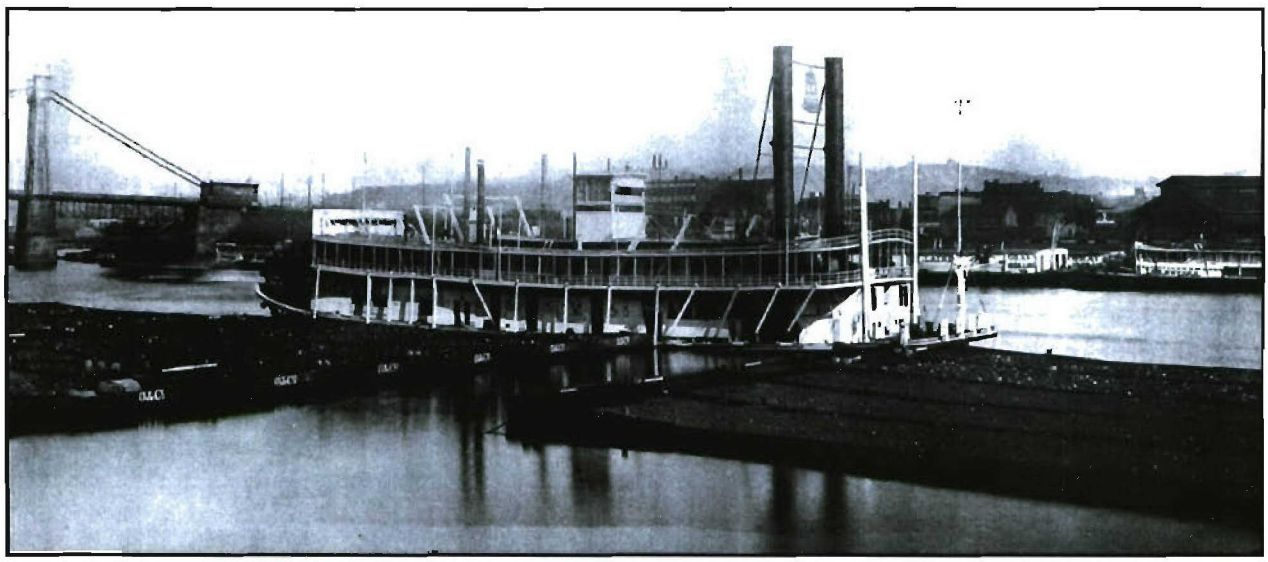


Figure 93. **Perhaps the most famous of the hopper barges was the Pittsburgh, or Pennsylvania coal flat; Mark Twain noted that this vessel was one of the last stops for keelboat men. In this photograph, the *W. W. O'Neil* appears to be setting up a tow of a large number of heavily laden coal flats (Photo courtesy of Mohney 2003).**

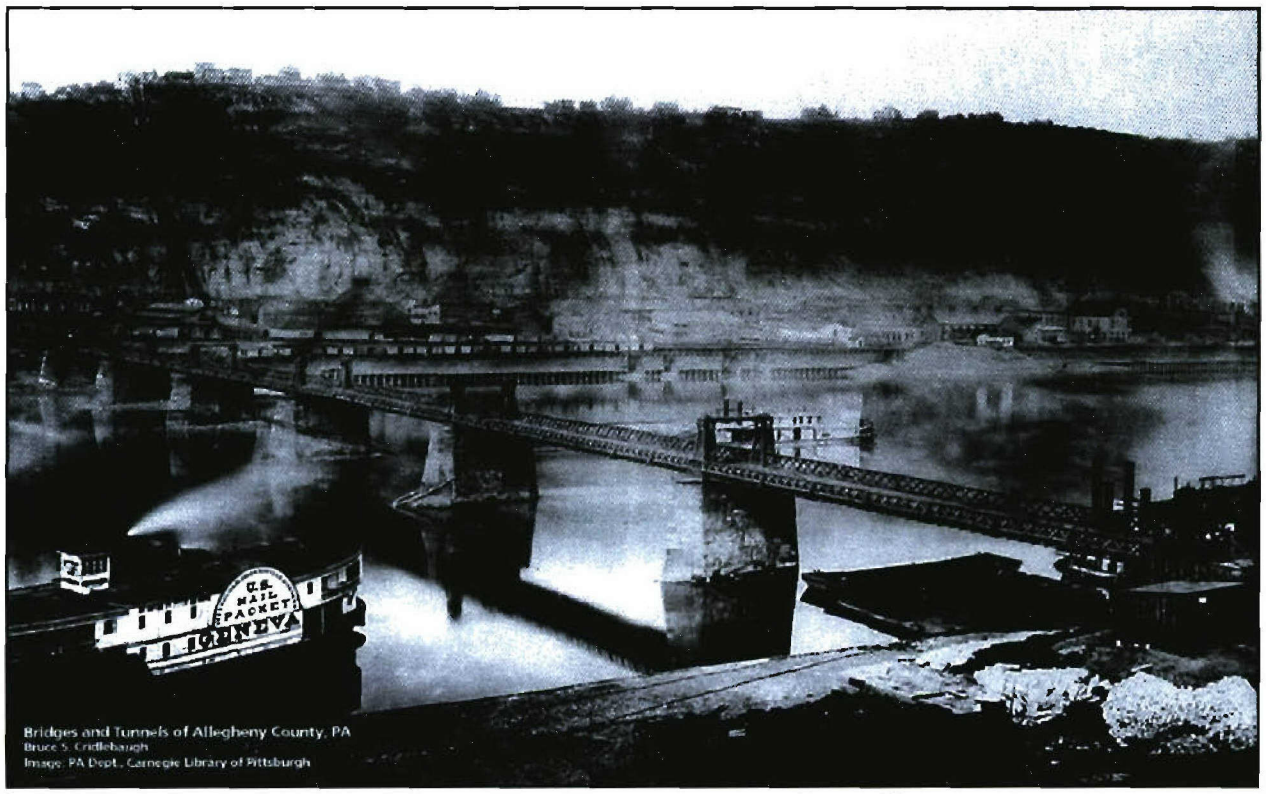


Figure 94. **In this photograph, "Bridges and Tunnels of Allegheny County, PA," four Pennsylvania coal flats can be seen under the railroad bridge. Note the distinct rake to their ends (Photo courtesy of the Carnegie Library of Pittsburgh, available online, Mohney 2003).**



Figure 95. **This photograph shows deck barge no. 19, owned by the Bisso family, moored and in use as a "coal barge" during the early part of the twentieth century (Photo courtesy William A. Bisso, III Historic Photograph Collection).**



Figure 96. **This photograph, ca. 1977, depicts barge no. 535, owned by Bisso Marine. The vessel was in the vicinity of the current project area, and was being used as storage (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

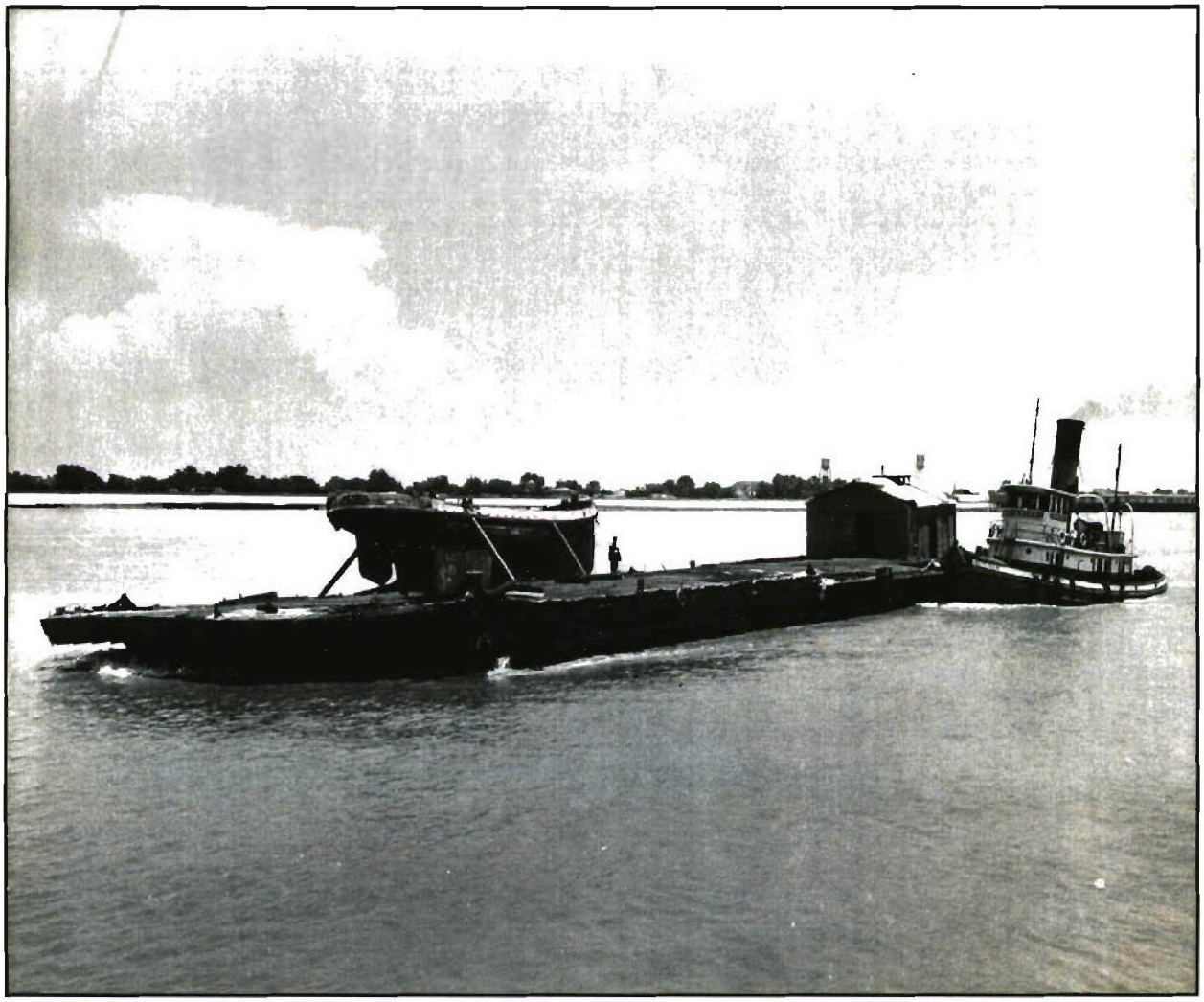


Figure 97. **This photograph depicts the evolution of a vessel on the river. This barge originally was built by James Eads as an ironclad monitor, the *Chickasaw*. After the Civil War, it was converted to a railroad ferry, and renamed the *Gouldsboro*. Toward the end of its life, the ship was altered again; here, the deck barge *Gouldsboro* was used as a temporary shipyard to re-power and rebuild a small tugboat (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

They are crucial to the success of waterfront and marine salvage operations. These barges usually are equipped with a large "A" frame, which operates a large boom. Below the "A" frame, a deckhouse usually houses the derrick machinery and crew.

Derrick barges are used in the shipbuilding industry to launch hulls, and to lift and join decks and deckhouses to hulls. Occasionally, they are used to launch entire ships. A derrick barge generally is equipped with ballast tanks in the stern to counterbalance the weight of the lift load. On especially big jobs, it is not uncommon that more than one derrick barge is employed. For example, Figure 98 depicts at least three derrick barges operating together to raise a sunken platform or barge in front of a dam.

Spud Barges

The spud barge is named for the "spuds," or heavy poles, that typically are mounted in the corners, or along the sides of the barge. These may be lowered to the riverbed through wells in the hull, and driven into the riverbed by jacking down on the spuds to secure the barge in a stationary location without the use of anchors. Some barges have the capacity to rise up the spuds, out of the water, becoming platforms suspended in the air; these are used in the Gulf of Mexico oil and gas industry. Spud barges usually carry two to four spuds. These barges are sometimes powered vessels in their own right and are independent of tugboats or pushboats, unlike other "dumb barges."

The spud barge is a versatile deck barge that is used in differing configurations depending upon the job for which it is tasked. Figure 99 shows a "dumb" spud barge with a mobile crane and a grab bucket, possibly used in a small scale dredging operation; a "dumb" spud barge is moved to the work site by a pushboat. In addition, a container and covered area on the deck offers equipment storage and protection from the sun. The two very stout spuds dominate the barge profile.

Another example of a spud barge is the *Lois L.*, a self-propelled spud barge with two spuds and a small crane mounted on the starboard bow (Figure 100). It was configured to the specifications of R. Christopher & Associates, Inc. as a dive platform for nautical archeological work in Barataria Bay. A dive platform was installed at the bow of the barge that was stored in a vertical orientation for transit between dive sites. While on site, the *Lois L.* "spuds down" to provide a stationary dive platform. A shed was installed in front of the pilothouse for equipment storage, and as a diver changing room. A tarped area provided shade for the dive safety officer, standby diver, and the air station as well as the bank of K-bottles that supplied air to the divers.

Towboats (Steam Tugs)

Towboats, also known as tugboats and pushboats, were a crucial linchpin in the New Orleans' port economy, especially in the post-bellum period when barging cargoes became the cheapest shipping method. After many years in service, some steamers and packets were sold to tow companies. The early towboats of New Orleans were of the side-wheel variety, which weathered the rough seas of open water better than stern-wheelers. Hence, these tows traveled down the Mississippi to the Gulf of Mexico, where they picked up sailing vessels or large steamers. Generally, towboats that operated further upriver, and which did not venture out into the Gulf of Mexico, tended to be exclusively stern-wheelers (Bass 1996:203). Those tugs that were constructed specifically for towing generally were smaller than converted paddlewheelers. The smaller and lighter the hull of the towboat, the more tonnage it could move with its heavy engines.

An illustration of the towboat *Creole* from the 1851 bird's eye view of New Orleans printed by J. Bachman depicts the towboat assisting a sailing vessel upriver against the current (Figure 101). The *Creole* had only one smoke stack, unlike the common configuration of two stacks. Another towboat shown in the 1851 drawing, partly obscured by a sailing vessel, also has a single stack, perhaps suggesting that this was common among towboats of the time. The two vessels are lashed side by side, rather than using a towing or pushing configuration. This gave the towboat more control over the sailing vessel than any other arrangement. Clearly, some bumpers or fenders must have



Figure 98. **In a lift job in front of a dam, three derrick barges work together to raise a sunken platform or barge. Each derrick barge was equipped with a ballast tank in the stern, in order to counter-balance the weight of their lift load (Photo courtesy William A. Bisso, III Historic Photograph Collection).**



Figure 99. **This photograph illustrates a "dumb" spud barge, equipped with a mobile crane and a grab bucket. The pushboat can be seen in the background, providing power for the barge in what was a small scale dredging (Photo R. Christopher Goodwin & Associates, photographer not attributed).**



Figure 100. **The photograph depicts a self-propelled spud barge, the *Lois L.* This vessel is configured as a dive platform for nautical archeological work in Barataria Bay, with two spuds and a small crane mounted on her starboard bow (Photo R. Christopher Goodwin & Associates).**



Figure 101. **This excerpt from Bachman's "Bird's Eye View of New Orleans" shows the towboat *Creole* assisting a sailing vessel up river against the current (Bachman 1851, courtesy of the Library of Congress).**

been used to protect the paddlewheel housing; otherwise, the steamboat's crucial power pump was likely to be damaged.

Another drawing of New Orleans and its vicinity published in 1863 by Virtue & Co., shows a twin stack side-wheel steamer towing four barges in two twinned sets (Figure 102). The steamer does not appear to have been built as a tow, given its comparatively large size and stack arrangement. However, it clearly was engaged in towboat service and may represent a river cargo or passenger steamer converted to the purpose after the Civil War.

Over the next decade and a half, screw driven towboats replaced side-wheel tugs in most harbors in the country, and New Orleans was no exception (Koch 1876). Screw driven towboats were quite different in appearance, and they represented a significant break between old-fashioned river craft of the romantic period on the Mississippi, and modern day tug and pushboats.

The screw driven towboats had small hulls with no overhang or guards like their predecessors. Their hulls were built of both wood and iron, and equipped with a deckhouse and an elevated pilothouse. They generally were fashioned with a single smoke stack, and they were very close in appearance to modern tugboats. They were powered by coal stoked steam engines, rather than modern diesel engines. The Currier & Ives (1885) bird's eye view of New Orleans illustrates a number of these towboats. One vessel is isolated, and depicts the vessel's appearance clearly (Figure 103). Another section of the drawing depicts a towboat in the process of assisting a large sailing vessel down the channel towards the sea (Figure 104).

It is interesting to note that in other harbor depictions of the period, towboats are often shown towing their charges with a long length of cable. No photographs or drawings identified during the current project noted such a remote towing method. It is possible that the large volume of traffic in New Orleans and the narrowness and swift run of the river made this form of towing undesirable.

Tugboat Example: The Independent

The tugboat *Independent*, once owned and operated by the New Orleans Coal & Bisso Towboat Co., and later by Bisso Marine, Inc., is an excellent representative of the evolution of the tug during the twentieth century. The tug was built of riveted charcoal iron at Port Richmond, New York in 1901. The registered dimensions were 29.3 m (96.2 ft) long, with a beam of 6.4 m (21 ft), and a depth of 3.8 m (12.5 ft). It drew 2.1 m (7 ft) of water forward and 3.2 m (10.5 ft) aft – rather deep for the Mississippi River, clearly marking it for harbor or seagoing duty (Survey Report No. 63-390:1963:1). Like all powered vessels of the day, the *Independent* was a coal-burning steamship. Possibly in the mid-1930s judging by documentary sources for similar vessels, the *Independent* was converted to an oil burner (Certificate No. 8, Records of the United States Customs Service, Record of Enrollments from July 1, 1932 to June 30, 1937). Following the conversion, it retained the characteristically tall steamship funnel necessary to provide a good draft for sustaining an adequate head of steam.

The New Orleans Coal & Bisso Towboat Co, Inc. purchased the *Independent* ca. 1936 from the Whiteman Towing Co. at a cost of $55,000.00. During a good deal of the vessel's working life with the Bisso company, it functioned as a steamship (Figures 105 and 106). By the early 1960s, however, it became necessary to convert its power plant once again in order for it to continue in a useful role. During the 1950s, the trend was to convert or replace steam and slow-speed diesel tugs with high-speed diesel engines. These high-speed engines had marine reverse gear and clutch drives. Another option would have been to convert the *Independent* to an electric motor drive, powered by diesel generators (Survey Report No. 63-390:1963:2). The Bisso company was clearly working with some outdated materials, however, since in 1963, a slow-speed diesel engine was installed in the tug (Figure 107). Many of the Bisso competitors already had upgraded their engines to high-speed diesel. The New Orleans Coal & Bisso Towboat Company's reliance and continued use of steam and slow-speed diesel demonstrates that successful competition and survival in the towing business was not entirely dependent on the best and most updated marine engine technology on the market.



Figure 102. **This excerpt from J. Wells's panoramic map "New Orleans, La. and its Vicinity," published in 1863, shows a twin stack side-wheel steamer towing four barges in two twinned sets. Given its comparatively large size and stack arrangement, it appears that the vessel was not built as a tow, but was converted to that usage (Wells 1863, courtesy of the Library of Congress).**



Figure 103. **This excerpt from the Currier & Ives "City of New Orleans," executed in 1885, illustrates a screw towboat; note the wide hull and tall smokestack (Currier & Ives 1885, courtesy of the Library of Congress).**

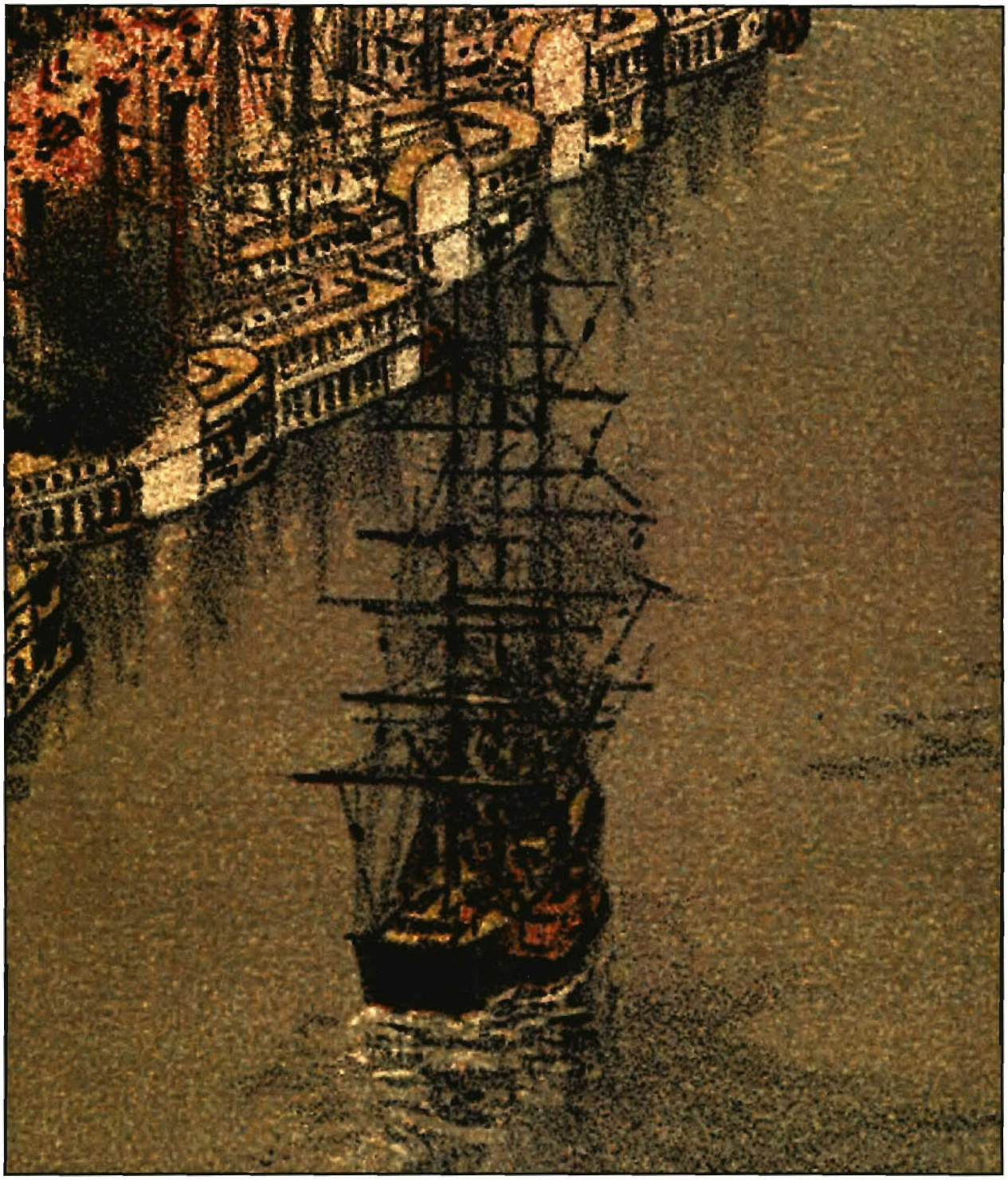


Figure 104. **This excerpt, also taken from Currier & Ives' panoramic view of New Orleans in 1885, depicts a tow-boat assisting a large sailing vessel down the channel towards the sea (Currier & Ives 1885, courtesy of the Library of Congress).**

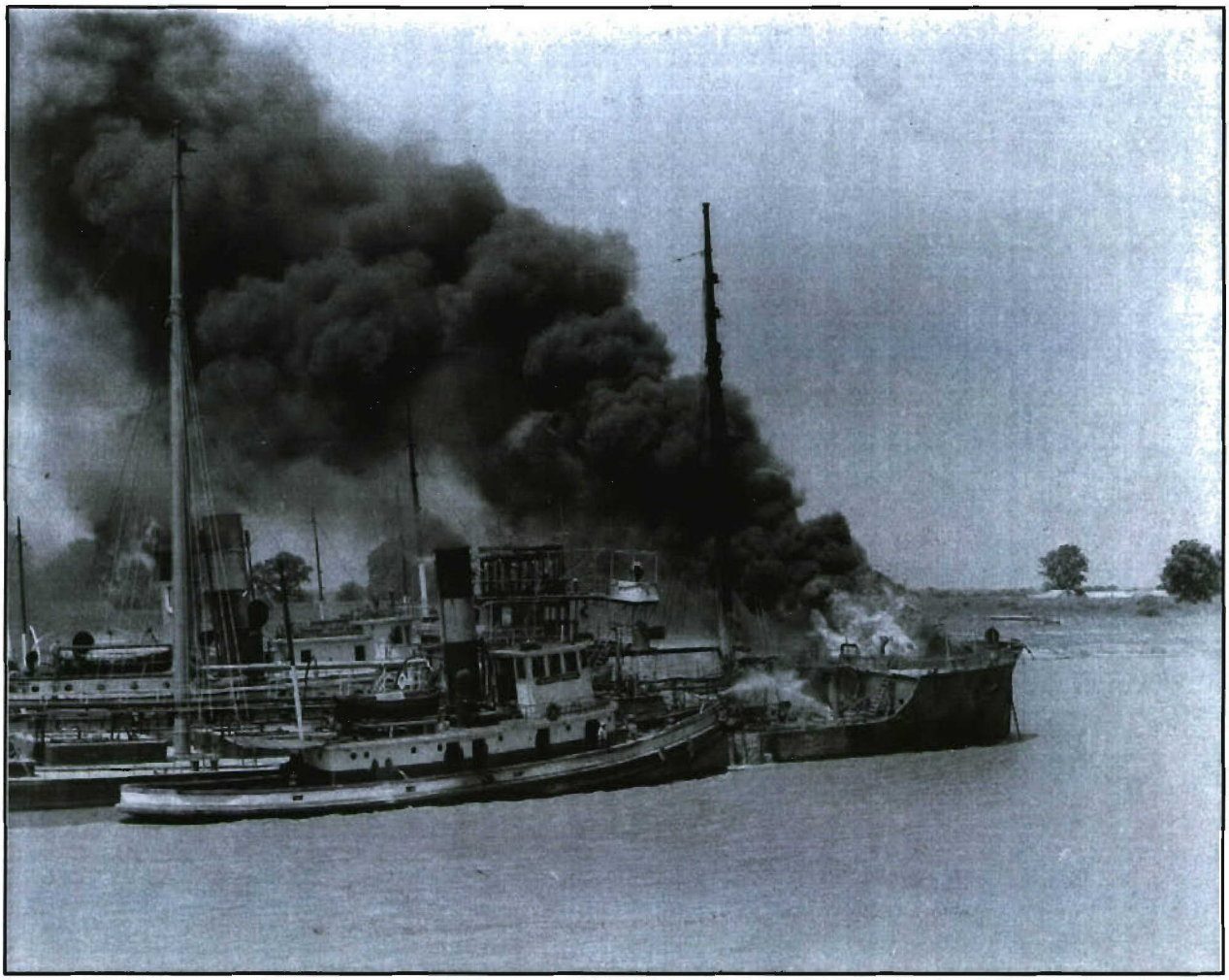


Figure 105. **This photograph illustrates the steam tug *Independent* fighting a fire onboard a tankership anchored on the river. The funnel of the *Independent*, along with all the vessels of the New Orleans Coal & Bisso Towboat Company, was painted black with a yellow stripe, for easy recognition at a distance (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

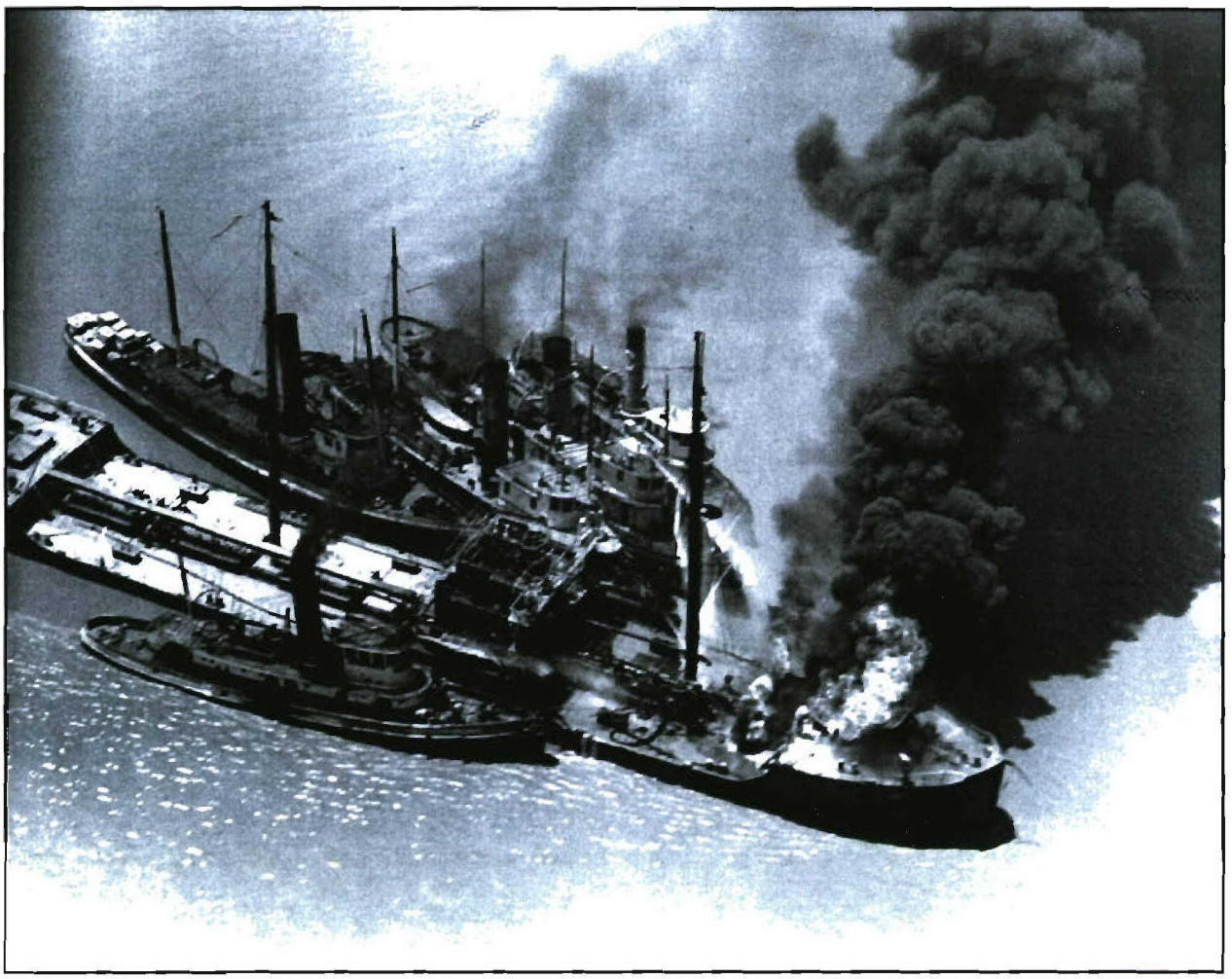


Figure 106. **This aerial photograph of the same tanker fire depicts the *Independent* in the foreground, working alongside a number of other tugboats to control the fire. At least two of the other tugs also were owned by the New Orleans Coal & Bisso Towboat Company, as identified by their funnel markings (Photo courtesy of the William A. Bisso, III Historic Photographic Collection).**



Figure 107. **In this photograph, the *Independent* is configured as a slow diesel vessel. Note the reduced size in the height of the funnel. The conversion to diesel resulted in a slight design alteration; the tall stack necessary to maintain a good draw on the furnace of a steam engine was no longer necessary (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

Pushboats

Pushboats were designed specifically for pushing barges up and down inland waterways, and may be considered closely related to tugs. The design change initiated as a specialized bow on a regular hull and power plant configuration (Figure 108). Two large vertical push pads located on a flat bow distinguish the pushboat. Eventually, the hull and power plant evolved into modern day pushboats (Figure 109). In the example illustrated, a small pushboat is lifted onto a custom-built deck cradle on the starboard side of a waiting freighter.

Since pushboats are designed specifically for pushing rather than pulling large tows, some barge designs have been adapted for the purpose. Some barges have a stern slot or notch for the bow of the pushboat to "lock in," effectively creating a single craft. Today, both towboats and pushboats fill the role of vessel tenders and cargo movers on the river, and both can be seen on the modern New Orleans waterfront.

Dredgeboats

Historically, dredges have played an important role in the maintenance of navigable inland waterways, especially the Mississippi River and its tributaries. The purpose of a dredge was, and still is, to increase or maintain water depth by removing sediments from the riverbed. This process was critical on the Mississippi River, where huge volumes of sediment narrow and block the channel, even forming into point bars that block navigation (Clay 1976:26).

The grab dredge was the first dredge to be used on the Mississippi. This resembled a large two-piece bucket, swung by a crane and dropped open into the river. Chains operated by a steam-powered winch, drew the two halves of the bucket together, taking a "bite" out of the riverbed. The illustrated example is mounted on the bow of a small hopper barge where the dredged sediments are deposited for disposal later in a designated location (Figure 110). By the turn of the twentieth century, suction dredges were slowly replacing grab dredges. The design of suction dredges has remained relatively unchanged over the course of the century. Suction dredges have a large tray, similar to a dustpan, attached to a suction hose, which is lowered to the riverbed. The hose uses suction to remove sediments that are pumped overboard in a slurry. Eventually, the discharged sediment is pumped through a large diameter pipe suspended on floats (Figure 111). This raft of pipe could be moved in order to discharge sediment where it would be most useful to the dredging endeavor at hand. Another type of dredge, developed later in the twentieth century, is known as the cutterhead dredge. This dredge was developed for use in hard-packed sediments and clays too compact for dustpan dredges. The number of blades on the cutterhead generally varied from three to six (Figure 112). Cutterhead dredges most often were used in changing the alignment of channels, and in harbor channel work (Clay 1976:180).

Dredgeboat Example: Cutterhead Dredge Indiana

The cutterhead *Indiana* is a good example of a twentieth century dredge. This dredge was used for years by the New Orleans Coal & Bisso Towboat Co., Inc., and it was involved in the salvage of the Union ironclad, city class gunboat, the *Cairo,* in 1964. The *Indiana* was included among the vessels surveyed by Bachrach & Co., Inc., in 1963. The *Indiana* was built of riveted charcoal iron for the U. S. Army Corps of Engineers. The date and place of construction are not known; however, the estimated age of the hull indicates that it was built ca. 1923. The vessel had a flush deck, square overhang stern, and a wooden two-story house superstructure. The approximate dimensions measured 39.6 m (130 ft) in length, with a beam of 9.1 m (30 ft), and a depth of 1.8 m (6 ft) (Survey Report No. 63-400:1963:1).

A full crew compliment for the *Indiana* consisted of 7 men for a 12-hour day, or 13 men for a 24-hour day. The craft also had a wooden lever room forward. At the time of the 1963 survey, the dredge's berthing, sanitary, and cooking facilities were unusable because the *Indiana* had been idle for approximately four years. Prior to that time, it only worked three months out of the year. Consequently, it was appraised at $18,000.00, near scrap value (Survey Report No. 63-400:1963:2).

The *Indiana* had been fitted with two outboard spud wells and two 6.1 x 21.3 m (20 x 70 ft) steel spuds (Survey Report No. 63-

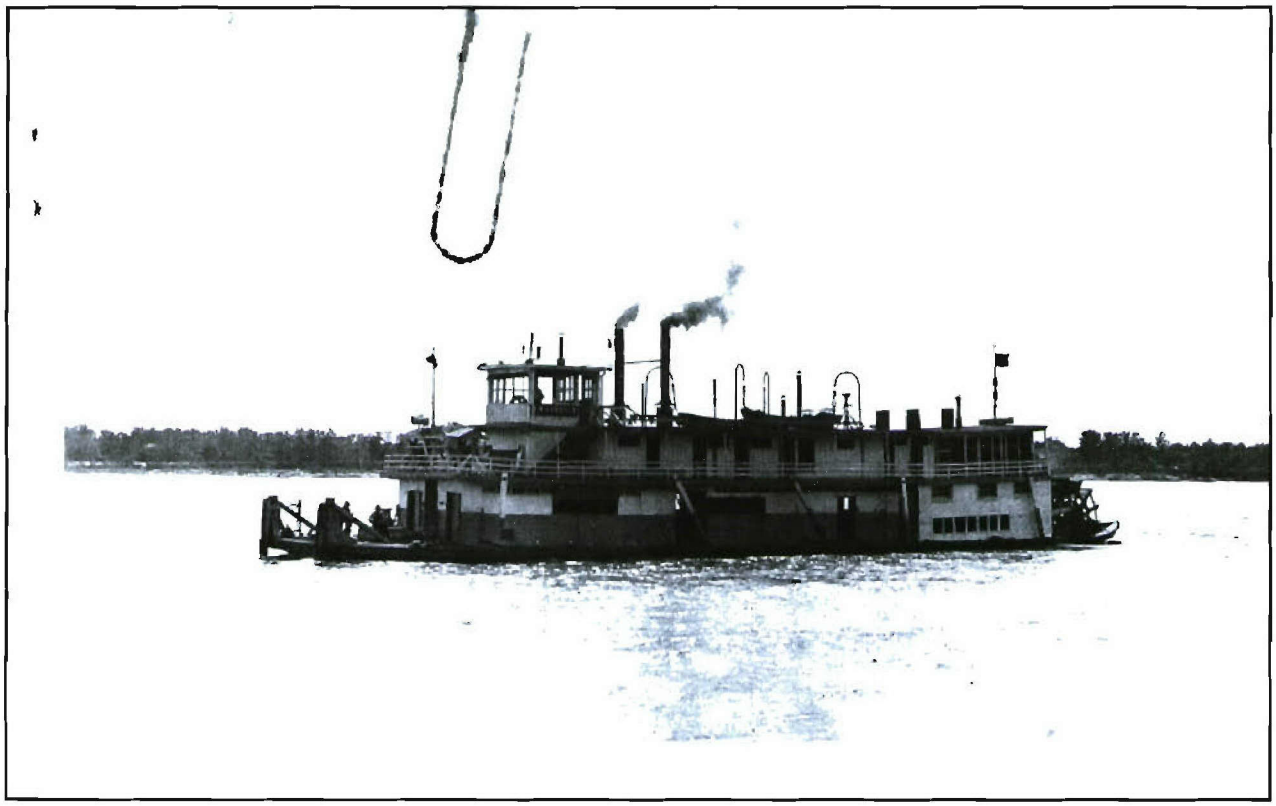


Figure 108. **This photograph of a stern-wheel pushboat illustrates the distinct, flat bow, and the stout, braced push pads (Photo courtesy William A. Bisso, III Historic Photograph Collection).**



Figure 109. **In this photograph, a modern pushboat is lifted by a derrick barge, and loaded as deck cargo onto a waiting freighter (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

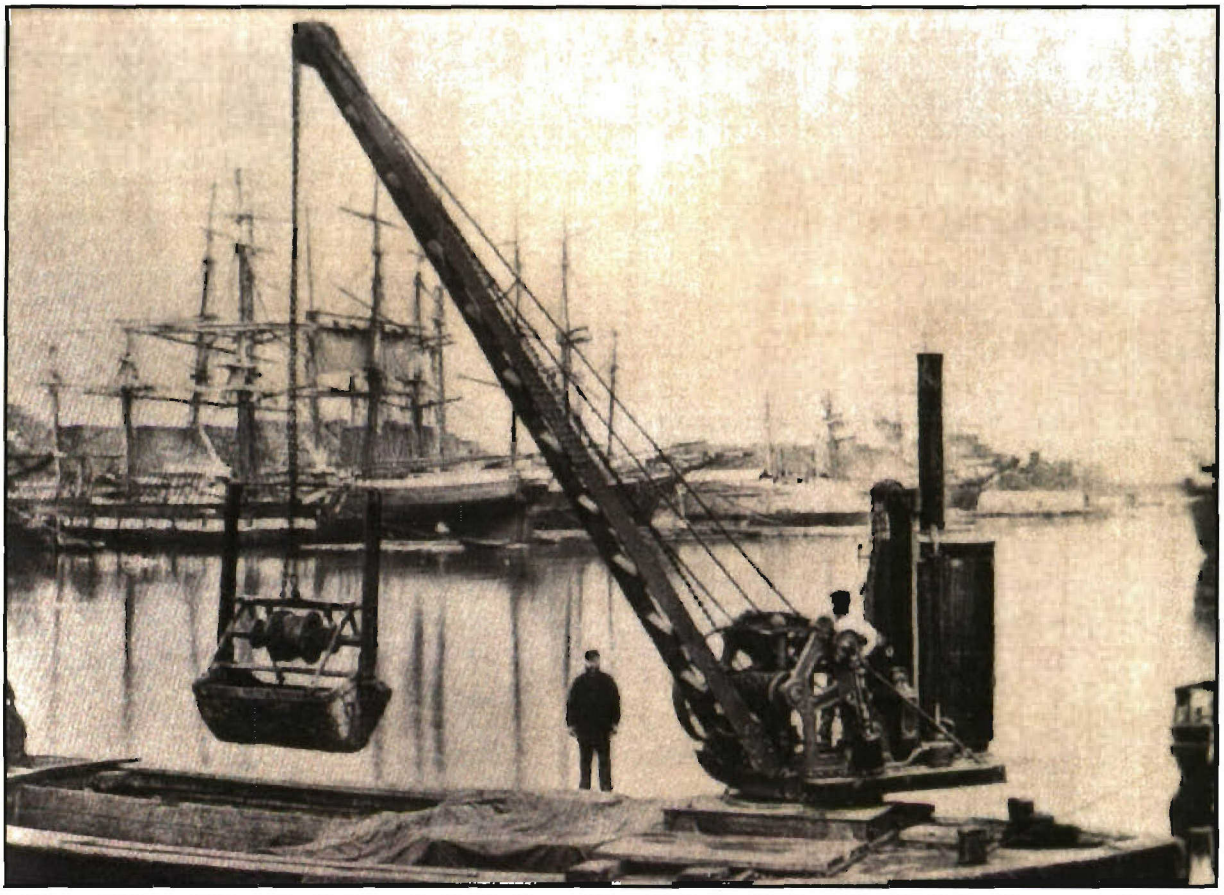


Figure 110. **This early photograph of a dredge grabber illustrates the two-piece bucket and crane mechanics. The crane swung the bucket to the dredge target, the bucket was opened, dropped to the riverbed, then closed and raised. Dredged materials then were deposited in a desired location. In this case, the dredge is mounted on the bow of a small hopper barge where the sediment was deposited for later disposal (excerpted from Clay 1976).**

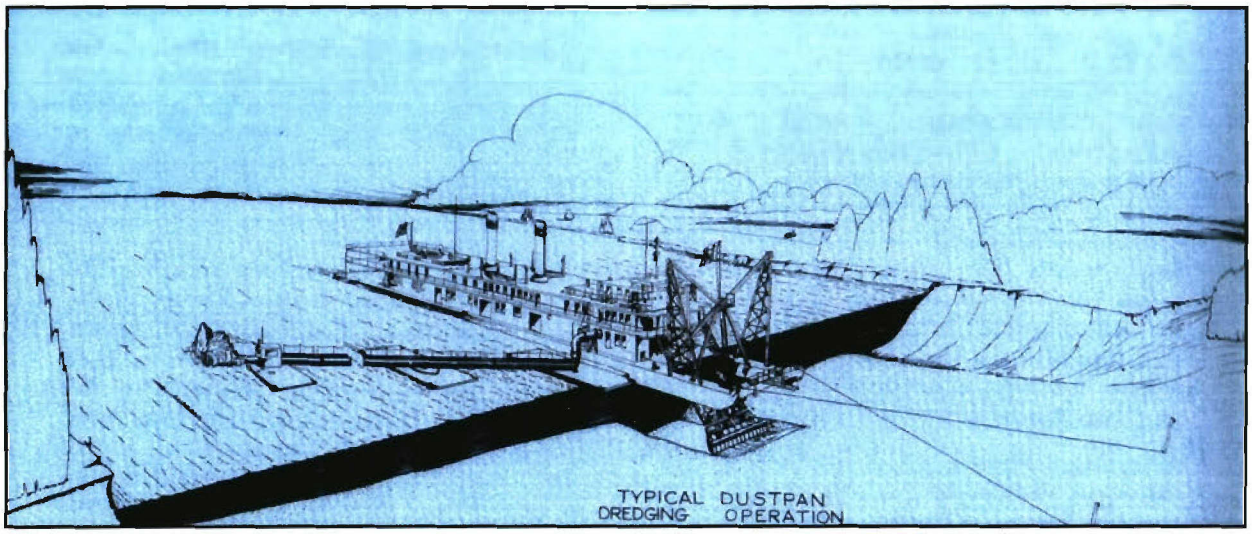


Figure 111. **This illustration depicts a dustpan suction dredge. Note the large tray that resembles a dustpan. The tray was lowered to the riverbed, suction commenced, and removed sediments were pumped into a slurry, and discharged through a large diameter pipe suspended on floats (excerpted from Clay 1976).**

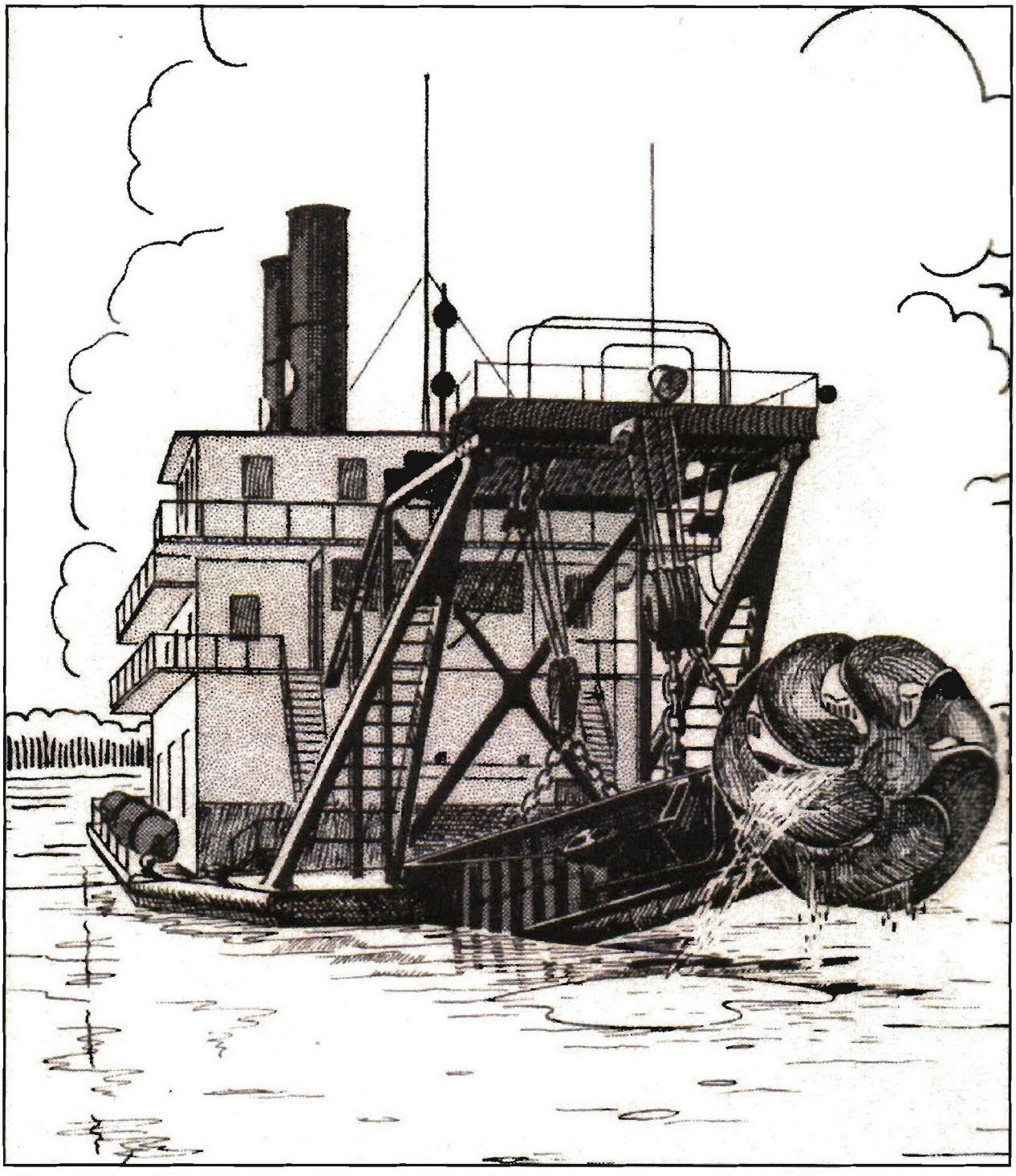


Figure 112. **This illustration portrays a cutterhead dredge. These dredges were developed for use in hard-packed sediments and clays (excerpted from Clay 1976).**

400:1963:1). The machinery consisted of one Cooper Bessemer 8-cylinder diesel engine, model JS8DR. This engine produced 725 H. P. at 400 rpm, driving a 43 cm (17 in) suction pump. A five-drum hoisting winch was mounted on the forward end, and it was driven by a General Motors model 6-71 diesel engine, run through a torque converter. It also had an off the main dredge engine, belt driven, two stage air compressor; a 6.4 cm (2.5 in) diameter centrifugal general service pump; and a 100 KW, DC generator. A 10 H. P. DC electric motor drove the 6.4 cm (2.5 in) diameter general service pump, while a 15 H. P. direct current electric motor drove the 7.6 cm (3 in) diameter water seal pump. A 7.6 cm (3 in) diameter centrifugal water-sealing pump was aboard at the time of the 1963 appraisal; however, the required electric motor was not noted (Survey Report No. 63-400:1963:2).

The 1963 appraisal of the *Indiana* also mentioned a one-H. P. direct current electric motor that drove a lube oil pump, as well as two fractional H. P. electric motors, each of which drove a pressure set fresh water pump. A 10 H. P. direct current electric motor drove a two-stage Gardner Denver air compressor, while the recorded four-cylinder gasoline engine drove a 5 KW, direct current generator. Although the gasoline engine was partly disassembled, the General Motors, model 6-71, diesel engine would have driven a 60 KW, direct current generator. In addition, the vessel was fitted with an open face-type switchboard. The *Indiana*'s machine shop contained a lathe, drill press, and shaper all driven by a 5 H. P. direct current electric motor, run through a belt drive. It also was equipped with a 75 H. P. direct current electric motor for driving the dredge cutterhead fitted to the end of its ladder.

Wharfboats

Even when the machinery, engine, and superstructure of a given vessel are well worn, some parts might be useful. Most commonly, a hull could be salvaged. Often, older vessels were stripped down to the hull, re-decked, and storage or warehouse structures built on the new decks. As a result, one of the last stops for many a river steamboat was its conversion into a wharfboat. These vessels often were tied to a convenient bank, serving as landings for cargoes and passengers. Some wharfboats housed offices, storage areas, and reception areas for crews and passengers, and sometimes these stripped vessels even had lodgings and dining facilities (Gandy and Gandy 1987:24, 41).

Passenger Ferryboats

The use of ferryboats to cross relatively narrow bodies of waters is not new. In fact, in Greek mythology, even the dead needed a ferry to cross the River Acheron to Hades, the land of the dead. To this end, the dead were buried with a coin in their mouth with which to pay the ferryman, Charon. Likewise, in the history of the New Orleans area, ferries played a vital role in binding the center of town to its outlying communities. This was especially important in the case of Algiers, situated directly across from the Vieux Carré, the heart of New Orleans. In the year 1858, as many as eight ferry routes had been established, crossing the Mississippi and servicing the greater New Orleans area; of these, five were dedicated to Algiers (Persac 1858).

Side-wheel, stern-wheel, centerwheel, and eventually screw propeller ferryboats all tended to have broad, unobstructed decks, with many differing arrangements of smokestacks and pilothouses (Bass 1996:203). An interesting example of a ferry from 1851 can be seen in Figure 113. This ferry, headed for the Gretna landing, is a side-wheeler with a single smokestack positioned far forward (Bachman 1851). The pilothouse appears to be offset to starboard, providing the pilot an unobstructed view forward. Passengers can be seen milling about on the upper deck around the pilothouse, while horses and carriages would have been stored below on the main deck of the ferry.

Another example of a ferry dating to 1858 comes from further upriver, at Baton Rouge. This image of the ferry *Julia*, drawn by noted Louisiana artist Marie Adrien Persac, shows the West Baton Rouge ferry. It is depicted as a relatively small side-wheel ferry with a partly open main deck that housed the steam machinery (Figure 114). The above deck was furnished with a cabin area for passengers, accessed by a stairway on the port side of the vessel (Persac 1858). The small pilothouse, centered at midships, is forward on the upper deck just before

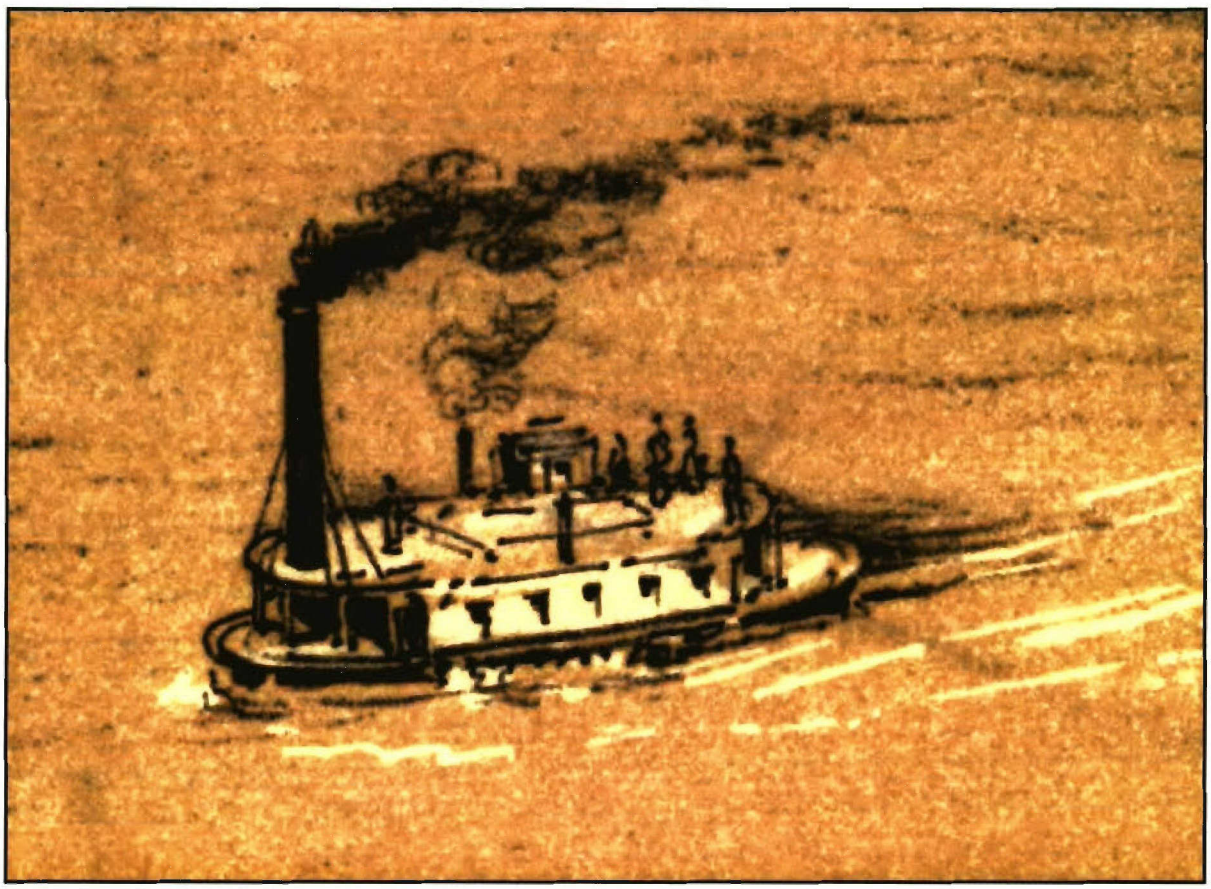


Figure 113. **This excerpt from Bachman's "Bird's eye View of New Orleans" highlights the New Orleans-Gretna ferry. Dating from 1851, the ferry was a side-wheeler with a single smokestack far forward (Bachman 1851, courtesy of the Library of Congress).**



Figure 114. **This excerpt from Persac's "Norman's Chart," depicts the small West Baton Rouge ferry, the *Julia*. Note that it was a relatively small, side-wheel ferry, containing a partly open main deck that held the steam machinery (Persac 1858, courtesy of the Library of Congress).**

the single smokestack. It is interesting to note that the ferry is putting ashore along the riverbank, demonstrating that not all ferries required wharf facilities to operate. Note what appear to be carriage tracks running to the waterside, an example of Persac's noted attention to detail.

That same year, Persac also painted the Algiers-to-New Orleans ferry arriving at New Orleans. Like the other ferries shown above, this was a side-wheel steamer with a single smokestack. In this case, however, the pilothouse was located behind the smokestack, sufficiently far away so as to not completely obstruct the pilot's view (Figure 115). This was a much larger ferry, containing three decks. A number of passengers can be seen on the bow in anticipation of docking, and a second deck, containing the passenger cabin area, has an open deck area toward the stern where another crowd is depicted (Persac 1858). All three of the above ferries have rounded bows and sterns, indicating that this was an important feature of these vessels during the antebellum era.

A later ferry, apparently a screw propeller, is shown making the run between Algiers and New Orleans; this vessel likely dates to the first decades of the twentieth century, since automobiles are visible on the deck (Figure 116). With the exception of the propulsion system, this ferry is very similar in appearance and configuration to the preceding example from 1858, suggesting that ferry typology did not vary significantly between the postbellum era and the first decades of the twentieth century.

Nonetheless, some variation in ferry design did emerge. Beginning in the late nineteenth or early twentieth century, a broad hulled catamaran ferry began running from Canal Street to Algiers. The *A. M. Halliday* is shown in Figure 117, with a single smokestack located behind the pilothouse affording the pilot a completely unobstructed view of the river, appears to have had a screw propeller propulsion system. A vehicle can be seen on the deck forward towards the bow. This photograph was taken at the Canal Street dock during the visit of President Theodore Roosevelt to New Orleans, on October 26, 1905 (Figure 117). The *A. M. Halliday* eventually would become the property of E. N. Bisso; it sank in the project area.

A somewhat later vessel is the ferryboat *Algiers,* shown crossing the river in 1920 (Figure 118). Like the *A. M. Halliday* above, it also was a catamaran. The *Algiers,* however, seems to have had a large passenger enclosure forward. Unlike the *A. M. Halliday*, it had two smokestacks on either side of the pilothouse. What appears to be a vehicle can be seen on the port side by the superstructure.

Railroad Ferryboats

Railroad ferries, often side-wheelers, also were known as transfers. These specialized vessels carried railroad cars across the Mississippi River before the advent of bridges. Obviously, these vessels were built to withstand the great weight of their deck cargoes. In order to achieve stability, they often incorporated elaborate hogging frames and chains to brace the hull. All transfers were fitted with rails running the length of the vessel in order to accommodate railway engines and railcars. In some cases, they had multiple sets of parallel tracks needed to hold several railcars side-by-side (Figure 119). Sometimes, as is the case in Figure 119, a pilothouse was located on a flying bridge, vaulted over the railcars. For pilots, such a configuration provided an unobstructed view of the river over their large cargo (Bass 1996:203).

Loading railroad cars onto a ferry required great care, as well as a solid lock with the docking facility, in order to ensure track alignment. Engineers utilized small switch engines to move the railcars onto the waiting ferry. It was necessary to ease three or four cars on at a time, in order to maintain the ferry's balance. Usually, the first car was placed on the center of the ferry, to maintain the vessel's equilibrium. Once the ferry arrived on the opposite bank of the river, another switch engine removed the cars from the ferry, assembling them in order behind the large road engine (Louisiana Railroad Museum 2003).

Railway ferries were more susceptible to interruption of service in times of high water than regular passenger ferries. While a passenger ferry was able to pull directly up to the levee for disembarkation, rail ferries needed even tracks to unload their cargo. During high water events, rail ferries were forced to wait until temporary floating rail transfer terminals were in place, or until regular rail docking fa-

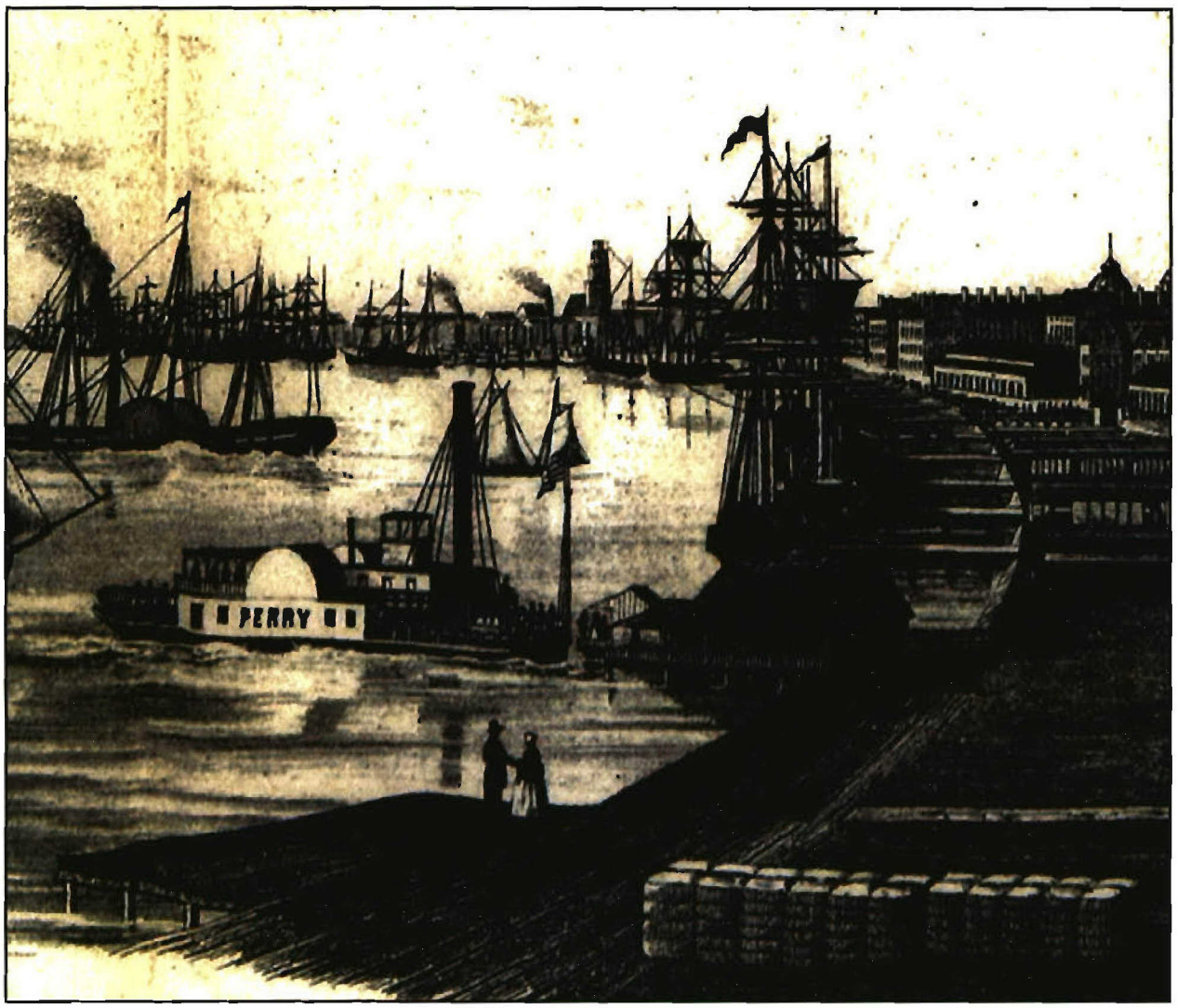


Figure 115. **This excerpt from "Norman's Chart," drawn by Persac in 1858, depicts the Algiers-to-New Orleans ferry. Like the other ferries shown above, it is a side-wheel steamer with a single smokestack. In this case however, the pilothouse is located behind the smokestack, set back sufficiently, to allow the pilot an unobstructed view (Persac 1858, courtesy of the Library of Congress).**

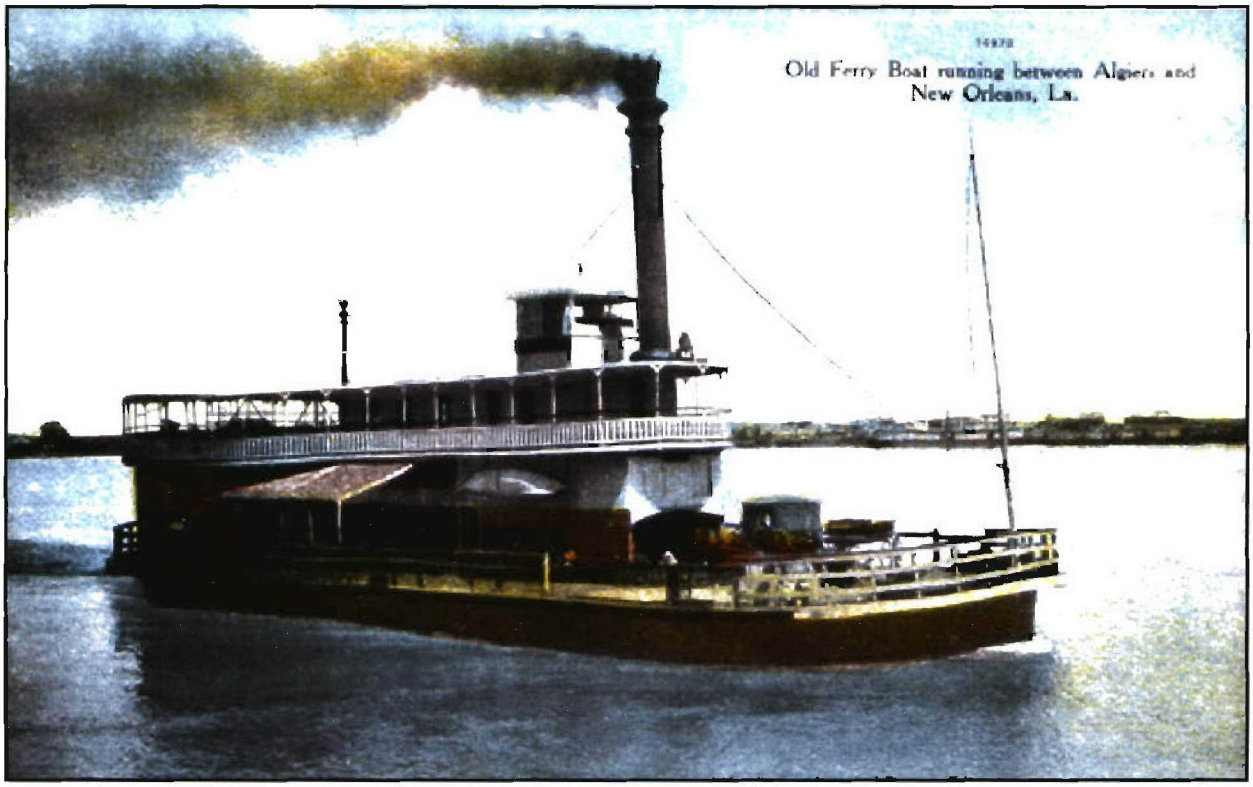


Figure 116. **This postcard of a ferry depicts an early twentieth-century vessel (note the automobiles on the deck) making the run between Algiers and New Orleans. The ferry closely resembles the 1858 ferry, pictured in the previous figure; this demonstrates the longevity of this vessel type (Photo courtesy of the Orleans Parish Public Library, Louisiana Division, Louisiana Postcard Collection).**

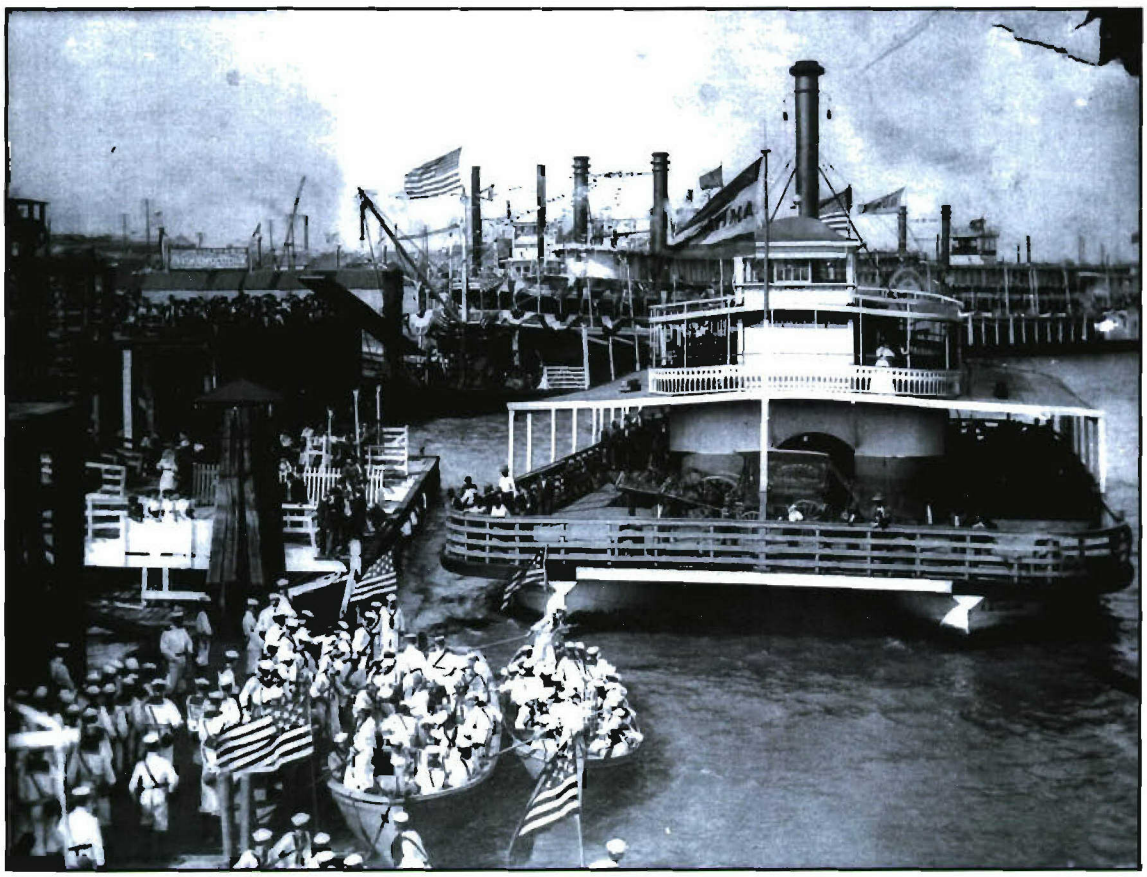


Figure 117. **This photograph of the catamaran ferry *A. M. Halliday*, depicts the large crowds gathered to catch a glimpse of President Theodore Roosevelt in New Orleans, on October 26, 1905. The catamaran hull was uncommon among river ferries nationwide; however, several examples of this design from the New Orleans area suggest that local ferry companies favored such a hull (Photo courtesy of the Orleans Parish Public Library, Louisiana Division, David Barrow Fischer Steamboat Collection).**

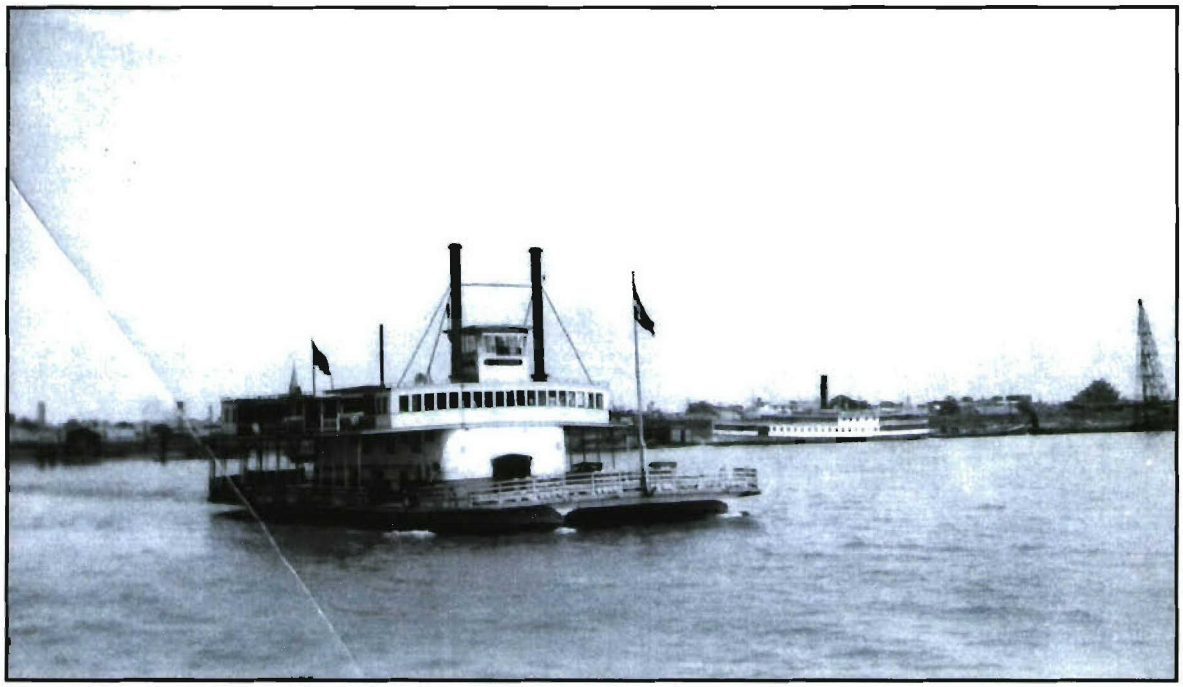


Figure 118. **This photograph of the ferryboat *Algiers* crossing the river in 1920 was taken by William J. Barker of *Algiers*. Like the *A. M. Halliday*, the Algiers had a catamaran hull, increasing both its size and stability (Photo courtesy of the Orleans Parish Public Library, Louisiana Division, William J. Barker Collection).**

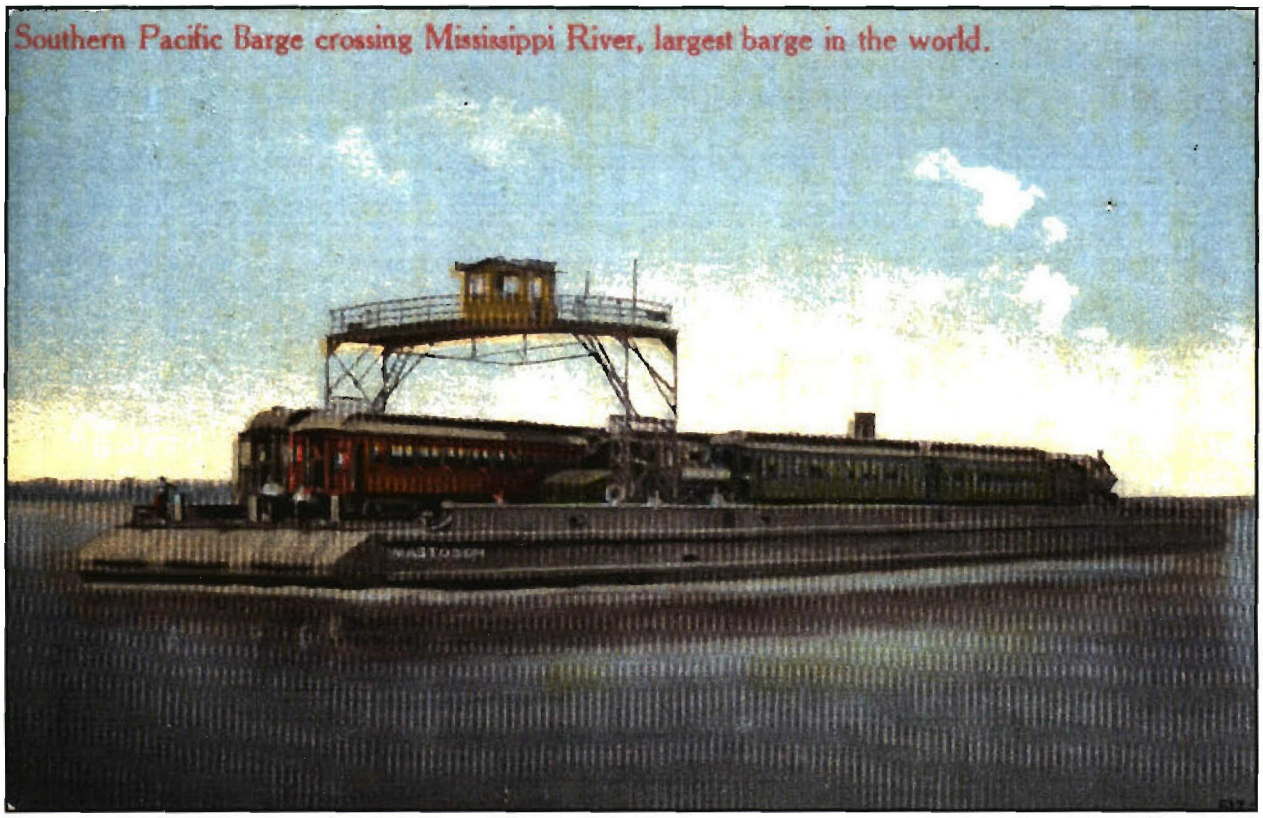


Figure 119. **This illustration depicts the railway ferry *Mastodon*, with multiple sets of parallel tracks designed to accommodate several railcars side-by-side. The pilothouse was supported on a flying bridge, providing an unobstructed view of the river over the top of the rail cars (Photo courtesy of the Orleans Parish Public Library, Louisiana Division, Louisiana Postcard Collection).**

cilities emerged from receding waters. For example, this was the case with the rail ferry at Helena, Arkansas in 1936 shown in Figure 120. In this case, a floating landing containing a section of temporary track was installed on top of the regular track; the regular track is shown descending into the water below the temporary track.

Coal Transfers

By 1885, when Currier & Ives executed their bird's eye view of New Orleans, a new vessel type made an appearance on the waterfront. Like so many other working craft, coal transfers were not beautiful, but they were highly specialized and functional. These vessels were floating structures, such as a barge or a ship, adapted with a tower on board. The tower combined with a conveyor system, either a conveyor belt or a series of buckets or other containers. Steam driven machinery, shore-based or based on the vessel, drove the conveyors. Conveyors allowed fast and efficient transfer of coal to fuel steamships, as well as loading cargo barges or colliers for shipment on the river.

The transfers shown in the 1885 drawing are characterized by enclosed towers on screw propeller tug-like hulls (Figure 121). The transfer hulls may themselves have carried the coal, necessitating the use of an internal conveyor system within the enclosed tower. Alternately, they may have erected a temporary, external conveyor system and extracted the coal from a barge alongside. The height of the tower was an important aspect of the system. It permitted the use of gravity in the transfer and discharge of coal directly into the holds, or coal bunkers, of waiting vessels by utilizing a canvas sleeve or other conveyor system.

Each of the illustrated transfer towers in Figures 121 and 122 had a large opening in the top, framed by two smaller openings. A long black streak stretched down from the central opening, which probably was the result of coal dust falling during the transfer process, resulting in a staining of the sides of the towers. Neither of the two transfers illustrated above include smokestacks that would indicate steam engines. The placement of the tower, and the heavy ballast necessary to keep these top-heavy craft afloat, would seem to exclude the possibility that these craft were powered. This strongly suggests that these are adaptive vessels, whose engines had been removed. As such, they required the use of a tug or pushboat for travel.

However, some of these transfers clearly had steam machinery on board. The tall and narrow smokestack on one transfer makes that clear (Figure 122). This stack is not as large in diameter as those of the contemporary screw propeller steam tugs in the 1885 drawing.

Archeological Expectations in the Submerged Portion of the Project Area

The Mississippi River clearly is an area of high probability for locating submerged cultural resources (Pearson et al. 1989; Terrell 1990). The Scope of Services for the Carrollton Revetment Project identifies 18 (later determined to be 19) obstructions in the submerged portion of the Area of Potential Effect. One of the tasks for the current project involves determining the nature of these obstructions, as well as pinpointing their location, condition, potential significance, and identities. The results of these aspects of this investigation as well as significance assessments and recommendations can be found in Chapter VIII of this report.

Given that several submerged resources were identified from the outset of the project, the expectation of locating shipwrecks was a foregone conclusion. Nonetheless, it should be expected that the majority of vessels in the Area of Potential Effect were related to the riverine and maritime industries that have operated at that location for more than a century. It also should be expected that those same maritime activities will have altered the condition of the submerged resources, either through active damage, such as cutting on the vessels, or through passive impaction, related to wake, engine, and drift damage.

In addition, a major river collision occurred in the project area in 1977, when the tanker *S. S. Sitala* impacted the fleet moored at two of the Bisso facilities. No doubt, several of the vessels located in the underwater portion of the Carrollton Revetment project area resulted from this collision. Furthermore, such a large and damaging marine accident may have damaged other underwater resources in the project area. Given the effect such an impact could have on the current project, the collision of the

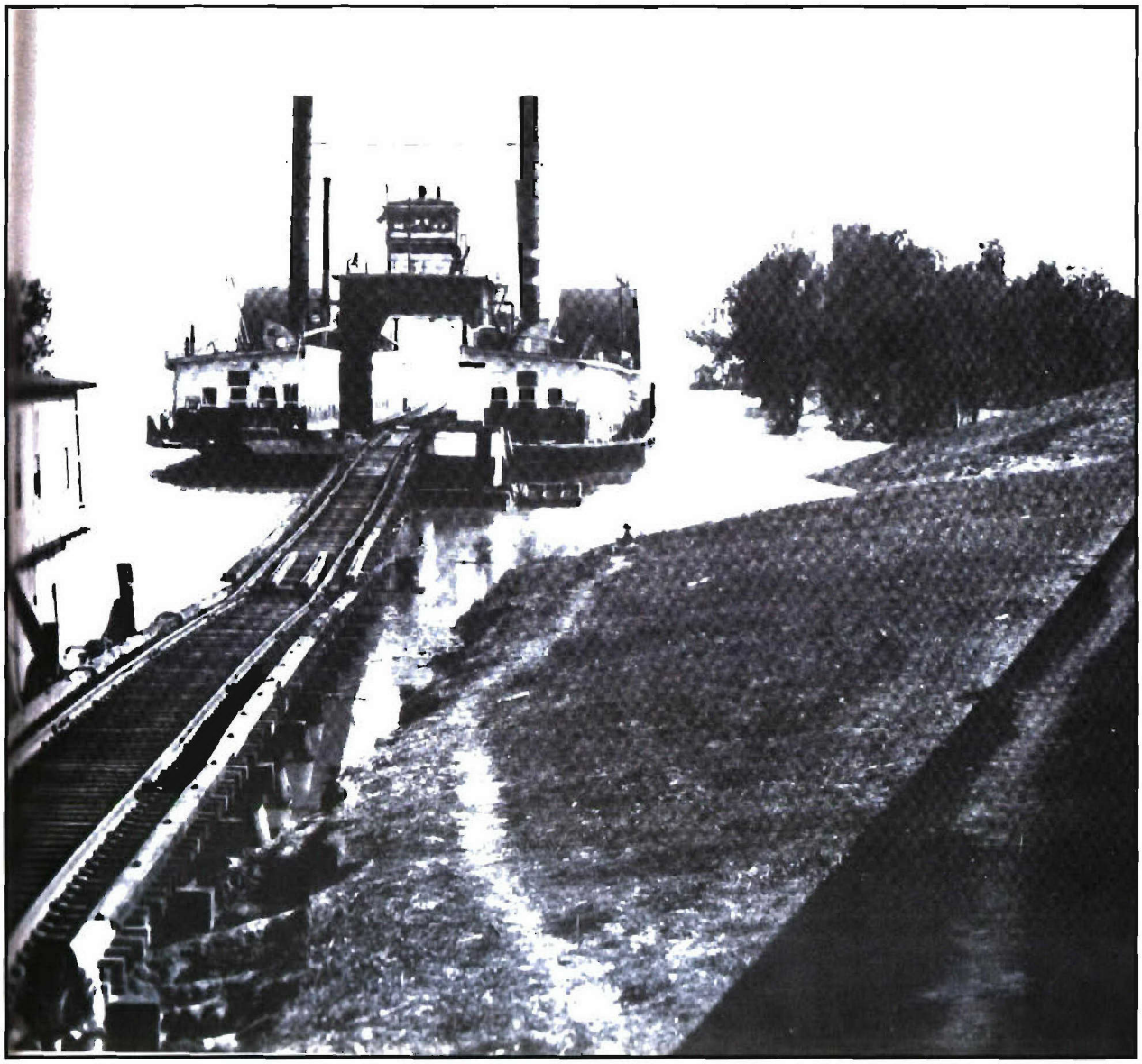


Figure 120. **This photograph depicts a rail ferry over the Mississippi River at Helena, Arkansas in 1936. A temporary floating rail transfer terminal was put into place until regular rail docking facilities emerged from receding waters. Note that the floating landing was installed on top of the regular track that can be seen descending into the water below the temporary track (excerpted from Clay 1976:143).**

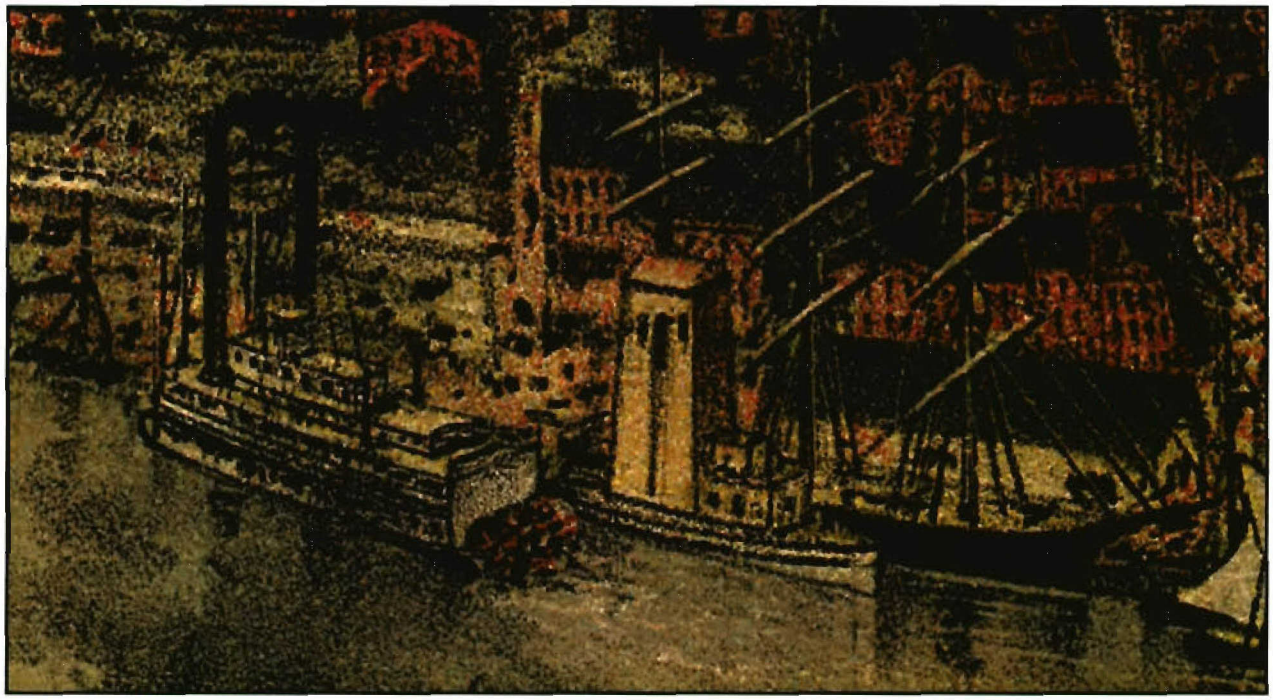


Figure 121. **[1885] This excerpt from Currier & Ives' painting "The City of New Orleans, and the Mississippi River, Lake Pontchartrain in the distance," illustrates a transfer designed with an enclosed tower on a screw propeller tug-like hull (Currier & Ives 1885, courtesy of the Library of Congress).**



Figure 122. **This transfer, also excerpted from Currier & Ives' "The City of New Orleans," differs from the previous figure; this bulk transfer vessel contains a tall, narrow smokestack, indicating the use of steam machinery on board (Currier & Ives 1885, courtesy of the Library of Congress).**

S. S. Sitala must be examined in detail, in order to assess the importance of the event.

In the very early hours of the morning of July 28, 1977, the *S. S. Sitala*, a French tankership loaded with 63,321 metric tons (approximately 19,420,000 gallons) of crude oil, departed the Belle Chase Anchorage, en route to the Marathon Oil Refinery at Garyville, Louisiana (NTSB 1978:2). A pilot from the New Orleans/Baton Rouge Pilots Association was on board as the vessel approached Greenville Bend. The weather was clear with very little wind (NTSB 1978:3). The *Sitala* was at "ahead full," doing approximately 13.3 miles per hour (approximately 11.5 knots) while stemming a river current that averaged some 2.0 mph. As the *Sitala* entered Greenville Bend, which is located approximately at Mile 101 (Above Head of Passes), the pilot ordered "right 10° rudder" to start his turn to follow the bend. Approximately one minute later he increased the rudder angle to right 20° to increase the vessel's rate of turn. As the *Sitala* completed her turn, the pilot ordered the rudder amidships. The pilot, the mate on watch, and the helmsman immediately noticed that although the rudder order input at the steering stand was amidships, the rudder remained at 20° right (NTSB 1978:3).

The pilot asked the mate on watch if the steering gear had failed. The mate replied that it had and that he was shifting steering to the Auxiliary mode. The pilot immediately ordered the engine stopped. Although the steering system was changed to the auxiliary mode and a rudder order for left full rudder was applied at the steering stand, the rudder remained at right 20°. The pilot then ordered the engines "back emergency," ordered "left full rudder," ordered that the anchor be dropped, and sounded the "danger signal" on the ship's whistle. At that point, the rudder angle indicator showed that the rudder was responding to the left full rudder order (NTSB 1978:3).

The port anchor was dropped when the *Sitala* was about 155 m (170 yds) from the Bisso fleet of barges and marine construction vessels moored to the right ascending bank, on the inside elbow of the Greenville Bend. When the anchor watch realized the *Sitala* would collide with the moored vessels, he ran from his station in the forecastle head without setting the port anchor after it was released. The mate on watch rang the ship's general alarm to alert the crew of the imminent collision. At 4:28 am, the *Sitala* collided with the derrick barge *Cappy Bisso,* pushing it into the other moored vessels (Figure 123; NTSB 1978:3, 5).

The massive lift structure of the *Cappy Bisso* collapsed across the bow of the *Sitala,* blocking the movement of both anchor chains. The wreckage of the lift structure held the *Sitala* and *Cappy Bisso* together as the bow of the *Sitala* began to swing left, moving the attached vessels toward the center of the river (Figure 124). When the *Sitala* had lost most of her headway, the pilot ordered the engine stopped. The U. S. Coast Guard of the Port of New Orleans was notified, and a lifeboat was launched to search for casualties (NTSB 1978:5).

The pilot called for tugs to assist in controlling the ship and the entangled derrick barge. As the *Sitala* drifted to the center of the river, she experienced a partial loss of electrical power, including power to the wheelhouse. Electrical power was restored approximately two minutes later and control of the vessel was regained by using the ship's engine and the steering gear with the assistance of several tugs. The *Sitala* remained in her position until the wreckage of the lifting structure was removed from her forecastle head at 19:42 hours. The *Sitala* was permitted to continue her voyage to the Marathon Oil Refinery at Garyville. Although the *Sitala* experienced another loss of steerage during this trip, no additional collision occurred (NTSB 1978:5).

The National Transportation Safety Board determined that the accident resulted from leaks in the steering hydraulic system, caused by a lack of maintenance. The leaks were so severe that hydraulic fluid had to be replaced regularly; however, no instructions were issued to the crew regarding a replenishment schedule. On July 28, 1977, the level of the hydraulic fluid became so low that the common suction for the charge pumps was exposed, drawing air into the system and causing the loss of steerage and the subsequent collision (NTSB 1978:16). The collision of the French-flagged lightering tanker *S. S. Sitala* with the marine construction fleet at the Bisso properties resulted in four sinkings and damage to several other vessels. One of the sunken vessels, the 33.5 m (110 ft) derrick barge *Arthur Breaux*, later was raised

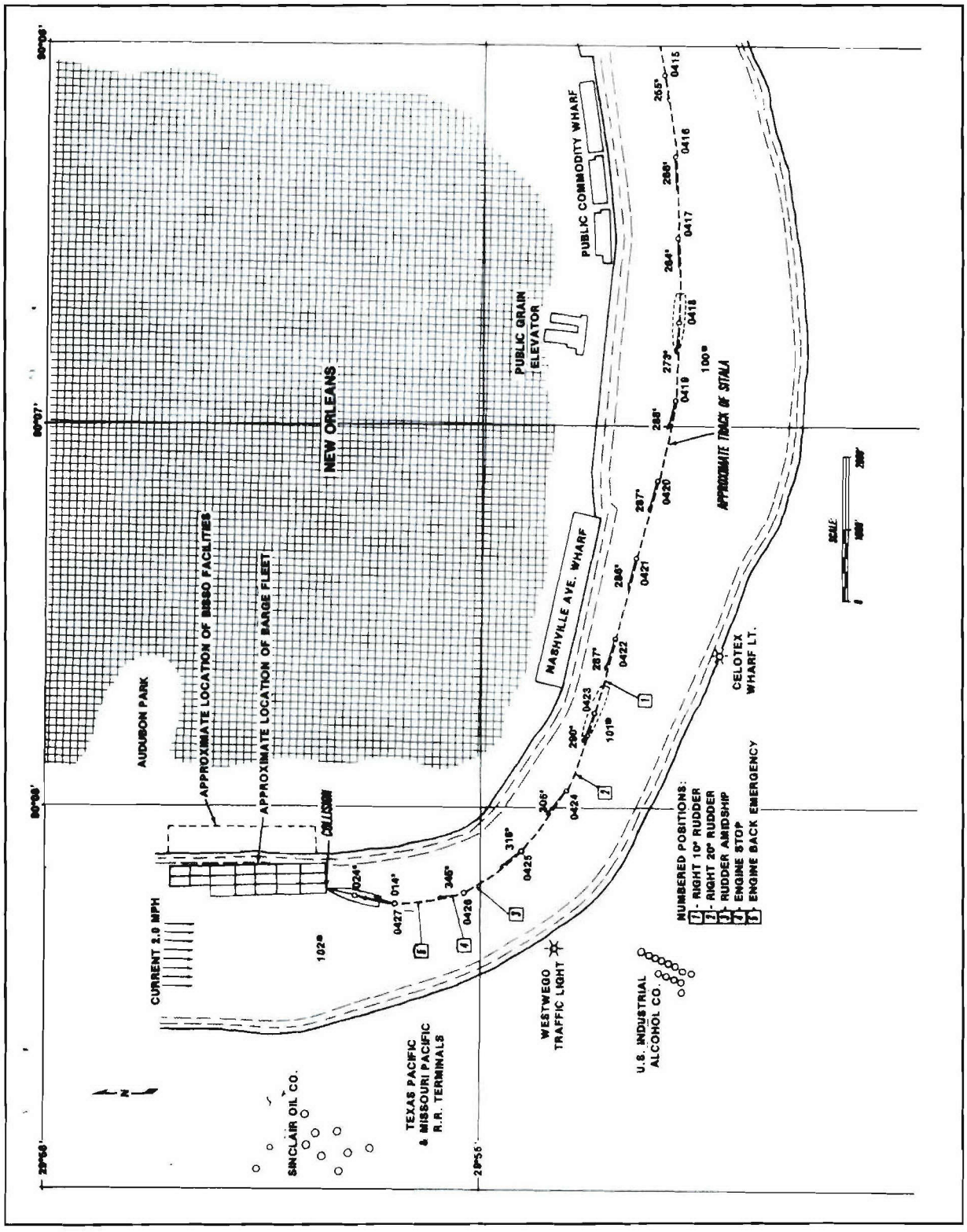


Figure 123. This drawing traces the approximate trackline of the *Sitala*, as it rounded Greensboro bend, before the accident (National Transportation Safety Board 1978).



Figure 124. **This photograph of the tanker *S. S. Sitala* depicts the damage caused by the collision. The derrick *Cappy Bisso* can be seen entangled in the bow of the tanker (Photo courtesy William A. Bisso, III, Historic Photograph Collection).**

and salvaged. The vessels lost in the accident include the derrick barge *Boaz*, *E.N.B. Barge 535*, and an unnamed tank barge; each vessel is discussed in Chapter VIII, below.

Several other general observations regarding the anticipated archeological remains can be made. The determination of the condition and identity of any individual vessel largely is contingent upon the quality of the remote sensing data. Since U. S. Army Corps of Engineers regulations prohibit high-risk diving in the muddy and unpredictable waters of the Mississippi River, visual reconnaissance was not possible. Similarly, because it is expected that the majority of submerged resources relate to the commercial enterprises located along the foreshore of the project area, the amount and accuracy of oral information relating to the project area clearly has great bearing on the success of the current undertaking. For example, much of the identification of discrete vessels, the exact location of each vessel relative to one another and in space, and the condition of each vessel only are available from the owners and employees of the three current Bisso companies.

Finally, it is possible that more vessels could be present than the 18 obstructions noted in the Scope of Services, due to the presence of a wharf and ferry landing at that location, as well as to the sweeping curve of the Greenville Bend of the Mississippi River in the vicinity of the project area. The Database of Louisiana Shipwrecks notes no less than 24 vessels located within a 0.8 m (0.5 mi) radius of the currently proposed Carrollton Revetment Project area (Clune and Wheeler 1991).

CHAPTER VI

PREVIOUS INVESTIGATIONS

Introduction

The stretch of the Mississippi River encompassing the Area of Potential Effect has been the subject of numerous cultural resources investigations. This chapter reviews archeological investigations conducted within 8 km (5 mi) of the proposed Carrollton Bend project area, as well as previously recorded archeological sites, historic standing structures, and National Register of Historic Places properties located within 1.6 km (1 mi) of the current study area (Figure 125). These data were gathered from the files of the State of Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, and from the Louisiana State Library in Baton Rouge, Louisiana. In addition to the state files reviewed in Baton Rouge, the Automated Wreck and Obstruction Information System (AWOIS) of the National Oceanic and Atmospheric Administration (NOAA), and *The Database of Louisiana Shipwrecks* (Clune and Wheeler 1991), were consulted for this investigation. The latter databases emphasized those shipwrecks that may be hazardous to navigation, or that were reported in historical documentation as lost in the project vicinity.

Previously Conducted Cultural Resources Investigations within 8 km (5 mi) of the Proposed Project Area

Background research for this project resulted in the identification of six cultural resources surveys that have been completed within 8 km (5 mi) of the Area of Potential Effect (Table 11). These surveys are discussed below in ascending order, by parish. The single survey completed in more than one parish is reported at the end of the section under the heading of Multiple Parishes.

Orleans Parish

On January 19, 1977, J. Richard Shenkel conducted a Phase I cultural resources survey and archeological inventory of the proposed Nashville Avenue to Napoleon Avenue Floodwall on behalf of the U.S. Army Corps of Engineers, New Orleans District (Shenkel 1977). The then-proposed project corridor measured approximately 2,317.2 m (7,602.5 ft) in length; however, the width of the proposed right-of-way corridor was not reported in the submitted report. Fieldwork completed as part of this investigation consisted primarily of pedestrian survey. As a result of the investigation, Shenkel (1977) concluded that the proposed floodwall would have no impacts on any significant archeological sites or historic standing structures. Thus, no additional testing of the proposed project area was recommended.

During 1991, Earth Search, Inc., of New Orleans, Louisiana completed Phase I cultural resources survey and archeological inventory of City Square 509, which is situated along Louisiana Avenue within the city of New Orleans (Franks and Yakubik 1991). The survey was conducted on behalf of the United States Postal Service, and it was completed prior to proposed construction of a postal service facility. Pedestrian survey of the project area augmented by shovel testing failed to identify any archeological sites; however, six historic standing structures noted at 2000, 2010, 2012/2014, and 2016/2018 Louisiana Street, as well as at 3417/3419 and 3421/3423 Daneel Streets, were identified within City Square 509. While no

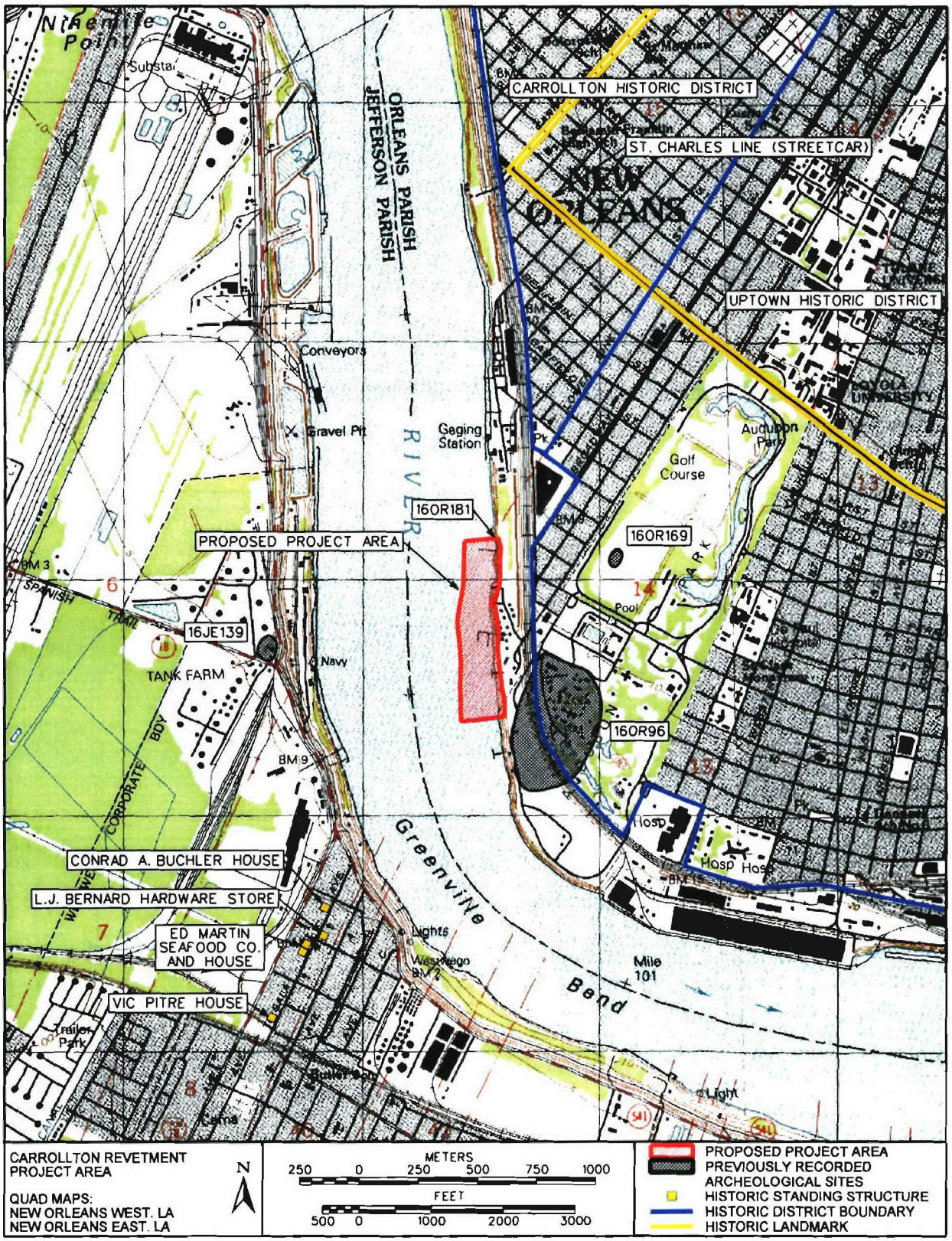


Figure 125. An excerpt from the 1992 digital U.S. Geological Survey 7.5' New Orleans East and 7.5' New Orleans West, Louisiana topographic quadrangle depicting the location of the proposed Carrollton Revetment Project Area and previously recorded sites and National Register properties and districts situated within 1.6 km (1 mi) of project area.

Table 11. Previously conducted surveys within 8 km (5 mi) of the proposed Carrollton Bend project area.

FIELD DATE	REPORT NUMBER	TITLE/AUTHOR	PROJECT DESCRIPTION	RESULTS AND RECOMMENDATIONS
Orleans Parish				
1977	22-53	*Cultural Resource Survey of the Nashville Avenue to Napoleon Avenue Floodwall, Mississippi River Levees, Item M-100-L, Orleans Levee District, Orleans Parish, Louisiana* (Shenkel 1977)	Records review and pedestrian survey	No cultural resources were identified and no additional testing was recommended.
1991	N/A	*Archaeological Survey of Square 509 (16OR135), Orleans Parish, Louisiana, for the Untied States Postal Service* (Franks and Yakubik 1991)	Records review, pedestrian survey, shovel testing, and unit excavation	Square 509 was assigned archeological site number 16OR135; however, no potentially significant resources were identified within the square. In addition, six structures were noted as being present within Square 509. These structures represented contributing elements to the Uptown New Orleans Historic District as such the authors recommended that HABS documentation be completed for each structure.
1993		*Phase I Archeological Investigations of 1820, 1828, and 1838 Calhoun Street, Square 97, Uptown Area, New Orleans, Louisiana* (Irion et al. 1994)	Records review, pedestrian survey, and shovel testing	Three structures were identified; however, all three of these were assessed as not and no additional recordation was recommended. The authors recommended that an archeologist monitor the removal of concrete paving within Square 97.
1997		*Supplemental Archeological Monitoring Conducted in Response to Recommendations Made as a Result of Phase I Investigations of 1820, 1828, and 1838 Calhoun Street, in Square 97 of the Uptown Area, New Orleans, Louisiana* (Simmons 1997)	Records review and pedestrian survey	Identified four cultural features (a possible stormwater drain, 2 concrete slabs, a section of concrete sidewalk, and a portion of a brick foundation). All four were assessed as not significant and no additional testing was recommended.
2001	22-2441	*An Evaluation of Materials Found During Construction of the Audubon Park Golf Course New Orleans, Louisiana* (Shuman 2001)	Records review, pedestrian survey, and opportunistic probing	Foundation remains of the Main Exposition Building of the 1884 World's Industrial and Cotton Centennial Exposition were noted and assigned site number 16OR169. The site was assessed as not significant and no additional testing was recommended.
Multiple Parishes				
1992	22-1621	*Cultural Resource Survey of Carrollton Bend Revetment, Mississippi River M-105.7 to 101.7-L, Jefferson and Orleans Parishes, Louisiana* (Hinks et al. 1993)	Records review, pedestrian survey, limited unit excavation and auger testing	No cultural resources were identified and no additional testing was recommended.

archeological sites were identified, City Square 509 was assigned State of Louisiana Site Number 16OR135 based on twentieth century residential use of the area throughout the city square. Franks and Yakubik (1991) stated that all six of the identified structures represented contributing elements to the Uptown New Orleans Historic District; however, none of these structures were assessed as significant individually applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). Nevertheless, Franks and Yakubik (1991) recommended that the structures be subjected to Historic Architectural Building Survey documentation. However, no additional archeological testing was recommended. Site 16OR135 is not positioned within 1.6 km (1 mi) of the current study area.

During November of 1993, R. Christopher Goodwin & Associates, Inc., of New Orleans, Louisiana, completed Phase I cultural resources survey and archeological inventory of a portion (Lots 5 to 10) of City Square 97. The project area was situated adjacent to Calhoun Street within the city of New Orleans (Irion et al. 1994). The survey was conducted at the request of the Loyola University of New Orleans, Louisiana, and it was completed prior to proposed expansion of the Loyola University library. While pedestrian survey of the project area and

the excavation of six shovel tests failed to identify any archeological deposits, three historic standing structures (1820, 1828, and 1838 Calhoun Street) were recorded within the project area. The authors stated that two of these buildings (1820 and 1828 Calhoun Street) represented contributing elements to the Uptown New Orleans Historic District. While the structures themselves were not assessed applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]), the associated archeological deposits were assessed as not significant applying the above-referenced criteria for evaluation (36 CFR 60.4 [a-d]). Irion et al. (1994) recommended that an archeologist monitor the removal of cement slabs present to the rear of the noted structures. These slabs prevented subsurface testing of portions of the study area during the survey; therefore, cultural deposits that may have been located beneath them were not examined.

Subsequently, the recommended monitoring of concrete slab removal within City Square 97 was conducted during November of 1996 by R. Christopher Goodwin & Associates, Inc. (Simmons 1997). During monitoring, four cultural features (Features 1 through 4) were identified and recorded. Feature 1 was described as a brick lined, probable stormwater drain, while Feature 2 consisted of two concrete pads and Feature 3 represented a section of concrete sidewalk. The remaining identified feature (Feature 4) was described as the remains of a disturbed brick foundation. All four of these cultural features were assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional testing of the proposed project area was recommended.

During October 2001, Surveys Unlimited Research Associates, Inc., of Baton Rouge, Louisiana completed an evaluation of historic structural remains identified during reconstruction of the Audubon Park Golf Course in the city of New Orleans, Louisiana (Shuman 2001). The survey was conducted at the request of The Audubon Nature Institute. Pedestrian survey of the project area resulted in the re-identification of portions of a foundation that consisted of brick and iron reinforcing bars and straps. These materials were assigned State of Louisiana Site Number 16OR169, and Shuman (2001) concluded that they represented foundation remains of the main building associated with the 1884 World's Industrial and Cotton Centennial Exposition. That building was in place from 1884 to 1885, at which time it was demolished. Despite the identification of the foundation remains, Site 16OR169 was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]); no additional testing of the project area was recommended. Site 16OR169 is positioned within 1.6 km (1 mi) of the current project area, and it is discussed in more detail below.

Multiple Parishes

During June 1992, R. Christopher Goodwin & Associates, Inc., conducted archival research and a Phase I/II cultural resources investigation of the batture portion of the Mississippi River between River Mile 105.7 and River Mile 101.7 within Jefferson and Orleans Parishes, Louisiana (Hinks et al. 1993). The survey was completed on behalf of the U.S. Army Corps of Engineers, New Orleans District; it was performed prior to proposed extension of that portion of the Carrollton Bend Revetment located north of and adjacent to the project area under consideration here. Pedestrian survey of the project area augmented by excavation of 86 auger tests and a single 1 x 2 m (3.3 x 6.6 ft) unit resulted in the identification of a single cultural resources locus (Location 1). Location 1 was described as a group of brick piers believed to date from after World War II; the piers were not found *in situ*. Hinks et al. (1993) suggested that the piers probably served to limit riverine cutting. Due to the lack of archeological integrity and research potential, it was determined that Location 1 did not warrant designation as an archeological site. This locus was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]), and no additional testing of the area was recommended.

Previously Recorded Archeological Sites Located within 1.6 km (1 mi) of the Proposed Carrollton Bend Project Area

A review of the Louisiana site files at the State of Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Devel-

Table 12. Previously identified sites within 1.6 km (1 mi) of the currently proposed Carrollton Bend project area.

SITE NUMBER	USGS 7.5' QUAD	SITE DESCRIPTION	CULTURAL AFFILIATION	FIELD METHODS	NRHP ELIGIBILITY	RECORDED BY
Jefferson Parish						
16JE139	New Orleans West, La.	Location of Seven Oaks Plantation	18th to 20th century historic period	Pedestrian survey	Not assessed	Clemensen 1983; Mann and Schilling 2002
Orleans Parish						
16OR96	New Orleans West, La.	Possible former location of a structure	post 1830 - 1870	Mechanical excavation	Potentially significant	Gendel and Goodwin 1983
16OR169	New Orleans West, La.	Historic structural remains	Late 1800s	Pedestrian survey and limited probing	Not significant	Shuman 2001

opment, Division of Archaeology in Baton Rouge, Louisiana, resulted in the identification of three previously recorded archeological sites located within 1.6 km (1 mi) of the proposed project area (Figure 125; Table 12). Each of these sites is discussed in detail below.

Jefferson Parish

Site 16JE139 originally was recorded by Clemensen during April of 1983. Subsequently, a State of Louisiana Site Record Update Form for the site was completed during October of 2002 by Mann and Schilling. Site 16JE139 was identified within Section 7 of Township 13S, Range 23E (Figure 125). It measured 30.5 x 30.5 m (100 x 100 ft) in size, and it was described as a portion of the Seven Oaks Plantation. While pedestrian survey of the site area was conducted, no information concerning what, if any, cultural material was observed and/or collected from Site 16JE139 was reported on the submitted site form. It was noted, however, that the site dated from the eighteenth, nineteenth, and twentieth centuries. Site 16JE139 was not assessed applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]); however, additional testing of the site area was recommended.

Orleans Parish

Site 16OR96 was recorded by Dr. Peter Gendel and Dr. R. Christopher Goodwin during October of 1983; it was located within Section 14 of Township 13S, Range 11E on land owned by the Audubon Zoo (Figure 125). Site 16OR96 was described as a scatter of historic artifacts. A brick floor underlain by a lens of charcoal speckled matrix containing faunal specimens and historic ceramic sherds also was identified within the site area. Backhoe excavation of the area resulted in the collection of 20+ *Bos* talus fragments, five historic ceramic sherds, and structural remains. Due to the presence of faunal specimens and charcoal, it was suggested that Site 16OR96 represented a kitchen area. Site 16OR96 was assessed as potentially significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). Preservation of Site 16OR96 in place, as well as mapping of the location of the former unspecified plantation structures, was recommended on the submitted site form.

Site 16OR169 was identified within Section 14 of Township 13S, Range 11E (Figure 125). Shuman recorded this site during October, 2001, it measured 50 x 75 m (164 x 246.1 ft) in size, and it was noted during reconstruction of the Audubon Park Golf Course. Pedestrian survey of the site area resulted in the recordation of structural remains comprised of mortared bricks, cypress timbers, iron rebar, nails, and spikes. Shuman did not note if any of these materials were collected from the site area. It was suggested, however, that Site 16OR169 represented foundation remains of the main building at the 1884 World's Industrial and Cotton Centennial Exposition, which was in place during 1884 and 1885. Despite its content and association with the 1884 World's Industrial and Cotton Centennial Exposition, Site 16OR169 was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR

60.4 [a-d]). No additional testing of the site area was recommended.

Previously Recorded Historic Standing Structures and National Register of Historic Places Properties within 1.6 km (1 mi) of the Proposed Carrollton Bend Project Area

A review of the historic standing structure files located at the Louisiana State Library, Baton Rouge, Louisiana resulted in the identification of 108 previously recorded historic standing structures (26-227 to 26-260, 26-266 to 26-279, 26-282 to 26-286, 26-288 to 26-291, 26-295, 26-299 to 26-310, 26-216 to 26-322, and 26-324), five National Register properties, and two historic districts within 1.6 km (1 mi) of the proposed project area (Table 13). All of the 108 individually listed standing structures were situated on the opposite bank of the Mississippi River within the town of Westwego, Louisiana. As these buildings are well removed from the current Area of Potential Effect, they will not be affected by the current project in any way; as such, they are not reviewed below. On the other hand, while four National Register properties also are located in Westwego, they provide information on that community at the turn of the century. The identified National Register of Historic Places properties and districts are discussed below in chronological order by the parish in which they are situated.

Jefferson Parish

The Vic Pitre House (Standing Structure 26-260) is located at 476 Sala Avenue in Westwego, Louisiana; it was listed on the National Register of Historic Places in August, 1998 (Figure 125). Constructed in 1925, this residential structure was described as representative of the Craftsman style with Colonial Revival elements (Figure 126). It has a second story built only over the rear portion of the structure. The Vic Pitre House was considered to be significant in the area of Politics/Government, due to its association with Victorin A. Pitre, the first elected mayor of the town of Westwego from 1921 to 1941. Mr. Pitre resided in the structure from its construction until his death in 1957. The National Register of Historic Places Nomination Form states that during Pitre's tenure as mayor, many municipal improvements, such as paved streets and sidewalks, natural gas service, and a modern water supply, were made within the town.

The Conrad A. Buchler House (Standing Structure 26-250) was listed on the National Register of Historic Places in September, 1999. The structure was described as a residential building located at 236 Sala Avenue within the town of Westwego, Louisiana (Figure 125). As with the Vic Pitre House, the Conrad A. Buchler House was constructed in the Craftsman style, and it exhibited elements of the Colonial Revival style (Figure 127). In addition, two outbuildings (a garage and a greenhouse) were considered to be contributing elements to the Conrad A. Buchler House, which was built in 1911. Both of these dependencies were constructed ca. 1920. According to information presented on the National Register of Historic Places Registration Form, the Conrad A. Buchler is one of few residences within the town of Westwego that exhibits any architectural style. It also was considered to be significant in the area of Politics/ Government, due to its association with Conrad A. Buchler. According to the National Register of Historic Places Nomination Form, Conrad A. Buchler was appointed the first mayor of Westwego upon its incorporation in 1919 and served in this capacity until 1921. Buchler resided in the subject property from 1913 until his death in 1935.

The L. J. Bernard Hardware Store (Standing Structure 26-242) is situated at 275 Sala Avenue in Westwego; it was listed on the National Register of Historic Places in September, 2000 (Figure 125). The structure consisted of a two-story frame commercial building that was constructed in 1907 (Figure 128). In addition, an associated metal storage building constructed ca. 1920 was considered to contribute to the National Register listed property. The L. J. Bernard Hardware Store did not exhibit any particular architectural style; however, the building was considered to be significant in the area of commerce. It was operated as the L. J. Bernard Hardware Store from 1917 to 1997, and it represented one of the few remaining commercial structures in the town of Westwego that dated from the early twentieth century.



Figure 126. View of the Vic Pitre House located at 476 Sala Avenue, Westwego, Louisiana.

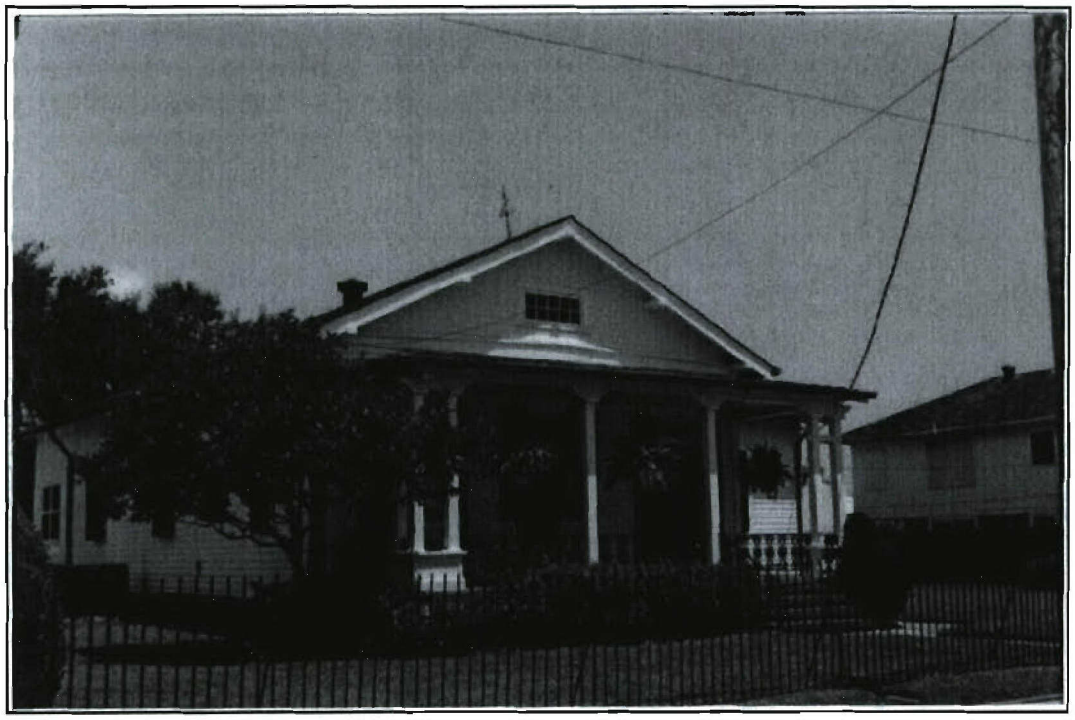


Figure 127. **View of the Conrad A. Buchler House located at 236 Sala Avenue, Westwego, Louisiana.**



Figure 128. **View of the L. J. Bernard Hardware Store located at 275 Sala Avenue, Westwego, Louisiana.**

Table 13. National Register of Historic Places listed properties located within 1.6 km (1 mi) of the currently proposed Carrollton Bend project area.

NAME	USGS 7.5' QUADRANGLE	ADDRESS	TYPE	ARCHITECTURAL STYLE	YEAR LISTED
Jefferson Parish					
Vic Pitre House	New Orleans West, La.	476 Sala Avenue, Westwego, La.	Urban Residence	Bungalow/Craftsman; Colonial Revival	1998
Conrad A. Buchler House	New Orleans West, La.	236 Sala Avenue, Westwego, La.	Urban Residence	Bungalow/Craftsman; Colonial Revival	1999
L. J. Bernard Hardware Store	New Orleans West, La.	275 Sala Avenue, Westwego, La.	Commercial Building	None Noted	2000
Ed Martin Seafood Company (factory and house)	New Orleans West, La.	300 Sala Avenue (factory) and 306 Sala Avenue (house), Westwego, La.	Industrial Building and Urban Residence	Factory: None Noted House: Spanish Colonial Revival	2000
Orleans Parish					
St. Charles Line (Streetcar)	New Orleans East, LA; New Orleans West, La.	Street Railway Route, New Orleans, La.	Transportation	N/A	1973
Uptown New Orleans Historic District	New Orleans East, LA; New Orleans West, La.	Roughly Bounded by Louisiana Avenue, Claiborne Avenue, Lowerline Street, and the Mississippi River	Historic District	Italianate, Gothic Revival, Creole, Greek Revival, Eastlake, Queen Anne, Colonial Revival, California, and 20th Century Eclectic	1985
Carrollton Historic District	New Orleans East, LA; New Orleans West, La.	Roughly Bounded by Monticello Avenue, Earhart Boulevard, Lowerline Street, and the Mississippi River	Historic District	Greek Revival, Italianate, Eastlake, Bungalow, Colonial Revival, Eclectic, and Plain	1987

The Ed Martin Seafood Company Factory and Home also was listed to the National Register of Historic Places during September 2000. The factory was positioned at 300 Sala Avenue in Westwego, while the house (Standing Structure 25-251) is located next door at 306 Sala Avenue (Figure 125). The factory, which was constructed of brick, was built in 1943, and it exhibited no particular architectural style (Figure 129). The residence, on the other hand, was constructed in the Mission/Spanish Colonial Revival style in 1948 (Figure 130). The Ed Martin Seafood Company Factory and Home were considered to be significant in the area of industry. The factory operated as a seafood processing plant from 1943 to 1973; it represents the only remaining historic processing plant within the town of Westwego.

Orleans Parish

The St. Charles Line (Streetcar) was listed on the National Register of Historic Places during May, 1973. According to information provided on the National Register of Historic Places Inventory – Nomination Form, the St. Charles Line consists of an overhead electric trolley utilizing single cars. The St. Charles Line originally was conceived as a way to link the suburb of Carrollton to the city of New Orleans. It extends along St. Charles Avenue between Carrollton Avenue and Canal Street, at which point it loops back along a single track to Lee Circle. The streetcar route covers a distance of 21.6 km (13.4 mi) (Figure 125). The St. Charles Line began operation in 1835 as the Carrollton Line and it utilized steam power until 1867, when horses and mules were put into service pulling the passenger cars (Figure 131). Subsequently, the streetcar line was electrified with an overhead wire system in 1893. The cars that have been in use since the mid 1920s are steel and consist of the arch roof type. The Brill and Perley Thomas Car Companies constructed these cars, and they contain 52 seats each. The St. Charles Line was considered to be nationally significant in the area of transportation. Informa-



Figure 129. **View of the Ed Martin Seafood Company factory building located at 300 Sala Avenue, Westwego, Louisiana.**



Figure 130. **View of the Ed Martin Seafood Company residential structure located at 306 Sala Avenue, Westwego, Louisiana.**



Figure 131. **General view of the St. Charles Line (Streetcar) located within the city of New Orleans.**

tion presented on the nomination form states that the St. Charles Line represents the oldest continuously operating streetcar line in the world.

The Uptown New Orleans District was listed in the National Register of Historic Places in July, 1985. The district measures approximately 914.6 ha (2,260 ac) in area and it is bounded to the west by Lowerline Street, to the south by the Mississippi River, to the east by Louisiana Avenue, and to the north by Claiborne Avenue (Figure 125). According to the National Register of Historic Places Inventory Nomination Form, the Uptown New Orleans District dates from ca. 1820 to 1935 (Figure 132). Overall, 10,716 structures are included within the Uptown New Orleans District. Of these, 1,959 structures were reported to represent intrusions; however, according to the National Register of Historic Places Inventory Nomination Form, these intrusions (mostly commercial structures and modern residences) do not significantly affect the historic character of the district. Based on a random sample of 54 city blocks, 954 structures were noted within the district. Building types included Creole tradition (1 percent), raised cottages (2 percent), shotgun houses (48 percent), camel back houses (4 percent), one-story side-hall plan houses (2 percent), multi-story side-hall plan houses (2 percent), one-and-one-half story center-hall houses (less than 1 percent), two-and-a-half story central-hall plan houses (less than 1 percent), one-story asymmetrical-plan houses (9 percent), two-story asymmetric-plan houses (17 percent), basement houses (10 percent), commercial buildings (3 percent), industrial buildings (less than 1 percent), and institutional buildings (1 percent). A total of nine period styles (Creole, Greek Revival, Gothic Revival, Italianate, Eastlake, Queen Anne, Colonial Revival, California, and 20th Century Eclectic), as well as the intrusions, were noted among the district's 10,716 structures. Of these 10,716 structures, 31 (0.3 percent) were described as Creole, 216 (2 percent) as Greek Revival, 19 (0.2 percent) as Gothic Revival, 1,634 (15.2 percent) as Italianate, 743 (6.9 percent) as Eastlake, 574 (5.4 percent) as Queen Anne, 1,164 (10.9 percent) as Colonial Revival, 1,271 (11.9 percent) as California, and 3,105 (29 percent) as 20th Century Eclectic. The remaining 1,959 (18.2 percent) structures consisted of intrusions.

Information presented on the National Register of Historic Places Inventory – Nomination Form indicated that the Uptown New Orleans Historic District was considered to be significant on a statewide level in the area of architecture. It contains a large quantity of examples of building types and styles from the late nineteenth and early twentieth century.

The Carrollton Historic District was listed on the National Register of Historic Places in November of 1987. The approximately 364.2 ha (900 ac) district is bounded roughly by Lowerline Street to the east, the Mississippi River to the south, Monticello Avenue to the west, and Earhart Boulevard to the north in New Orleans, Louisiana (Figure 125). With few exceptions, the district's buildings date from ca., 1880 to 1937 (Figure 133). According to the National Register of Historic Places Nomination Form, the Carrollton Historic District has not suffered an unacceptable loss of integrity since 1937. Comprised mostly of private residential buildings, the historic district consists of 5,198 buildings, including 104 Creole Cottage style houses (2 percent), 2,339 Shotgun style houses (45 percent), 103 Camelback style houses (2 percent), 884 Bungalow style houses (17 percent), 156 Side Hall style houses (3 percent), 365 commercial buildings (7 percent), and 1,247 unspecified buildings (24 percent). The eight structure styles included 18 Greek Revival (<1 percent), 405 Italianate (8 percent), 154 Eastlake (3 percent), 1,953 bungalow (38 percent), 536 Colonial Revival (10 percent), 328 eclectic (6 percent), and 938 "plain & other" (18 percent) structures. In addition, the Carrollton Historic District contained 886 (17 percent) structures classified as intrusions.

The Carrollton Historic District was considered to be architecturally significant on several levels. On the regional level, the district was significant due to the large number of Shotgun type residences, while on a statewide level, the district was significant due to its collection of 20th Century Eclectic structures. Finally, the Carrollton Historic District was considered significant locally because of its collection of Raised Bungalow structures.



Figure 132. **General view of residential structures contained within the Uptown New Orleans Historic District.**



Figure 133. **General view of residential structures contained within the Carrollton Historic District.**

Previously Recorded Shipwrecks and Submerged Obstructions Situated within 0.8 km (0.5 mi) of the Proposed Project Area

As noted above, the Automated Wreck and Obstruction Information System (AWOIS) maintained by the National Oceanic and Atmospheric Administration (NOAA) and *The Database of Louisiana Shipwrecks* (Clune and Wheeler 1991), which is on file at the State of Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology in Baton Rouge, Louisiana, were examined. The results of the search of these databases are discussed below.

Automated Wreck and Obstruction Information System Database

The Automated Wreck and Obstruction Information System database emphasizes shipwrecks and obstructions that may be considered a hazard to navigation. Background research for this project resulted in the identification of a single previously reported shipwreck listed in the Automated Wreck and Obstruction Information System Database within 0.8 km (0.5 mi) of the Area of Potential Effect (Figure 134; Table 14). The *Hazel W.* was described as a 13.7 m (45 ft) long tugboat that sunk at River Mile 101.5 in Orleans Parish. The vessel was reported lost on March 24, 1976 at Latitude 29.9201944, Longitude -90.136444. The wreck sank in approximately 21.3 m (70 ft) of water. No other anomalies or obstructions within the vicinity of the proposed Carrollton Revetment project area were listed in the Automated Wreck and Obstruction Information System database.

Louisiana Shipwreck Database

A review of *The Database of Louisiana Shipwrecks* (Clune and Wheeler 1991) resulted in the identification of 24 shipwrecks recorded within 0.8 km (0.5 mi) of the project area, between River Mile 94.5 and 104.0 (Figure 135; Table 15). Information presented on this database was gathered from historical references and archival documents. Latitude/longitude, river mile, and historical accounts were included on the database; however, at no time were locations of the shipwrecks field verified. As a result, multiple discrepancies are present among the three locational datasets contained in the database. For this investigation, only the latitude and longitude measurements were selected and utilized for placement of each wreck; however, there is no guarantee that the latitude/longitudes are correct.

Table 14. Previously identified shipwreck within 0.8 km (0.5 mi) of the currently proposed project area (excerpt from the Automated Wreck and Obstruction Information System).

RECRD	10903	VESSLTERMS	HAZEL W	CHART	11368	AREA	K
		CARTOCODE	0100	SNDINGCODE		DEPTH	
NATIVLAT	29 55 12	NATIVLON	090 08 11			NATIVDATUM	06
LAT83	29 55 12.7	LONG83	090 08 11.2			GPQUALITY	Med
LATDEC	29.920194444444	LONDEC	90.136444444445			GPSOURCE	Direct
History	HISTORY LNM12/76--8TH CGD, 3/24/76: THE 45 FOOT TUG HAZEL W HAS BEEN REPORTED SUNK AT MILE 101-5 IN APPROX POS. 29 55 12N, 090 08 11W. THE WRECK HAS 70 FEET OF WATER REPORTED OVER IT WITH THE NEW ORLEANS R GAGE READING AT PLUS 8 FEET.						
REFERENCE		YEARSUNK	1976	SYSTEMNUM	12934		

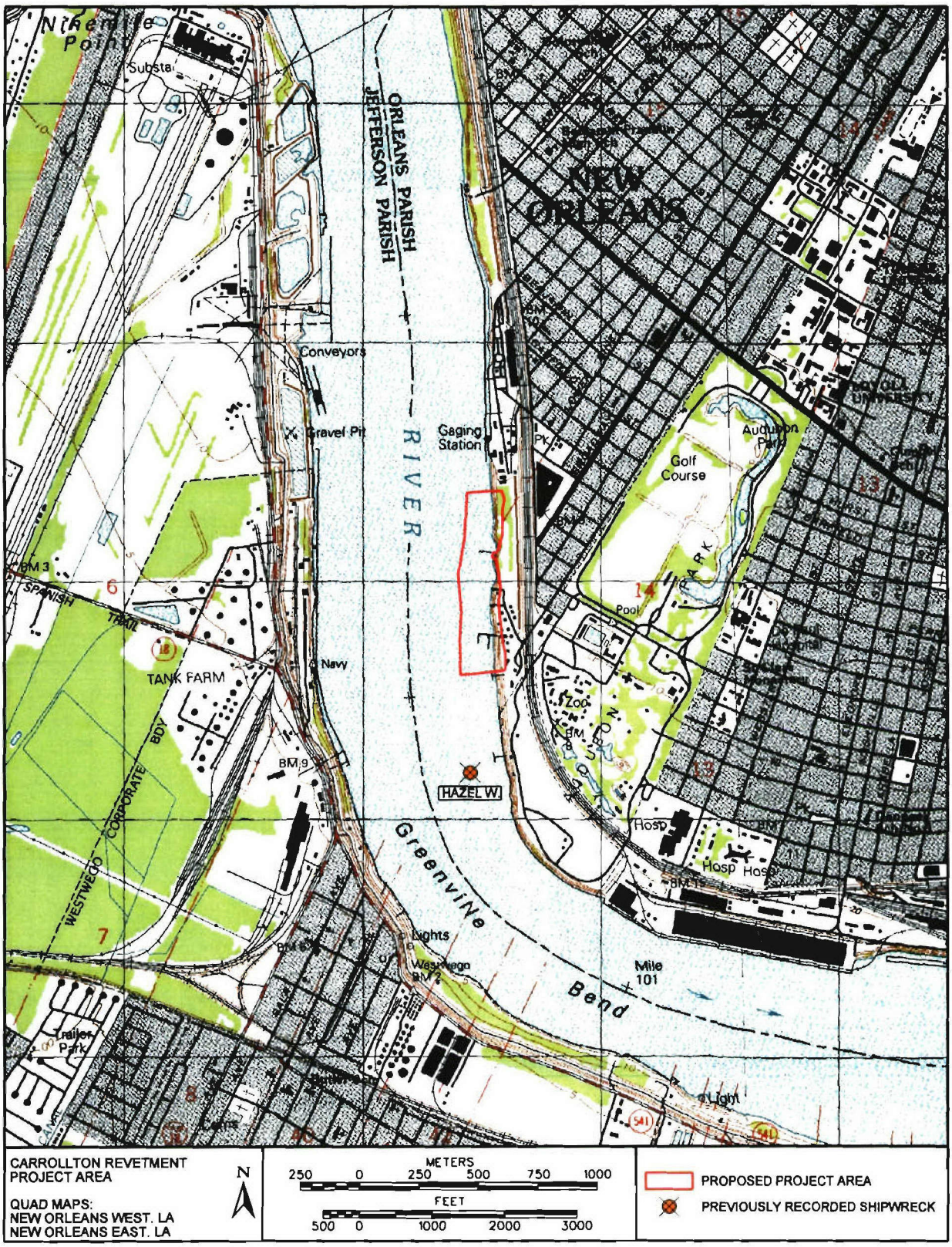


Figure 134. **Excerpts from the digital U.S.G.S. 7.5' New Orleans West and New Orleans East, Louisiana topographic quadrangles the location of the proposed Carrollton Revetment Project Area and previously recorded shipwrecks within 0.8 km (0.5 mi) of project area (from the Automated Wreck and Obstruction Information System).**

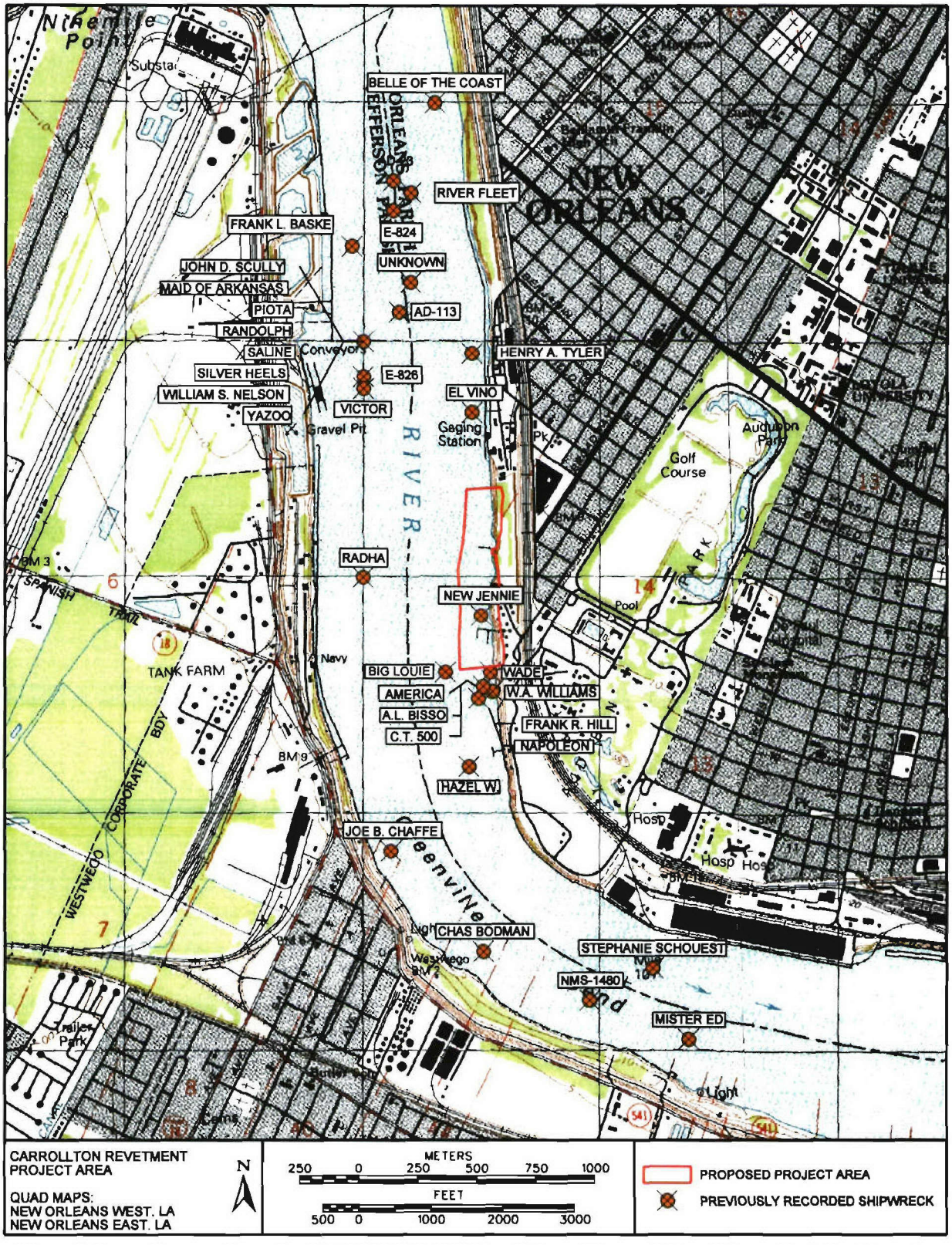


Figure 135. **Excerpts from the digital U.S.G.S. 7.5' New Orleans West and New Orleans East, Louisiana topographic quadrangles depicting the location of the proposed Carrollton Revetment Project Area and previously recorded shipwrecks within 0.8 km (0.5 mi) of project area (from the *The Database of Louisiana Shipwrecks* [Clune and Wheeler 1991]).**

Table 15. Previously identified shipwreck within 0.8 km (0.5 mi) of the currently proposed project area (excerpt from *The Database of Louisiana Shipwrecks* [Clune and Wheeler 1991]).

BOAT NAME	PARISH	RIVER MILE	LATDEC	LONDEC	ZONE	UTM Easting (NAD 27)	UTM Northing (NAD 27)	YEAR BUILT	VESSEL TYPE	DATE LOST	LOSS CAUSE	REMARKS	DATEREC
Victor	Orleans	094.5	29.904167	-90.090278	15	780966	3311725	1917	Steam	0/0/1945	foundered	At the foot of Walnut Street Wharf	5/5/1987
John D. Scully	Orleans	101.0	29.931944	-90.136111	15	776000	3315000	1878	Steam-stern wheel	8/20/1895	burned	Iron hull, 3 boilers, 1 chimney; called the "One-Armed John"	1/14/1987
Maid of Arkansas	Orleans	101.0	29.931944	-90.136111	15	776000	3315000	1840	Steam-side wheel	11/3/1842	burned		1/15/1987
Piota	Orleans	101.0	29.931944	-90.136111	15	776000	3315000	1858	Steam-side wheel	6/4/1859	burned	2 killed	1/16/1987
Randolph	Orleans	101.0	29.931944	-90.136111	15	776000	3315000	1833	Steam-side wheel	3/2/1841	snagged	1 killed; renamed the 'John Randolph' on 01/02/1837	1/16/1987
Saline	Orleans	101.0	29.931944	-90.136111	15	776000	3315000	1845	Steam-side wheel	6/5/1848	foundered		1/19/1987
Silver Heels	Orleans	101.0	29.931944	-90.136111	15	776000	3314000	1867	Steam-side wheel	10/2/1860	foundered	Lytle reports date built as 1857	1/19/1987
William S. Nelson	Orleans	101.0	29.931944	-90.136111	15	776000	3315000	1856	Steam-stern wheel	11/0/1859	burned		1/22/1987
Yazoo	Orleans	101.0	29.931944	-90.136111	15	776000	3315000	1842	Steam	3/31/1848	snagged	1 killed	2/18/1987
Hazel W.	Orleans	101.7	29.92	-90.136389	15	776450	3313200		Tow	3/25/1976	foundered	Wreck abandoned on June 17, 1976; TONNAGE reported as 15-100; USCG Case #62455.	5/1/1987
W.A. Williams	Orleans	101.9	29.922222	-90.135833	15	776550	3313520		Unknown	5/4/1899	stranded & swamped	Audubon Park Wharf	1/21/1987
Frank R. Hill	Orleans	102.1	29.925	-90.135556	15	776490	3313590	1905	Steam-side wheel	12/24/1907	foundered	Walnut Street Wharf, New Orleans	1/12/1987
Napoleon	Orleans	102.1	29.925	-90.135556	15	776490	3313490		Unknown	6/19/1906	snagged	Struck a submerged log; Walnut Street Wharf	1/15/1987
Wade	Orleans	102.1	29.925	-90.135556	15	776540	3313600		Unknown	3/25/1912	unknown	Walnut Street Wharf	1/21/1987
America	Orleans	102.1	29.925	-90.135556	15	776510	3313540	1898	Steam-stern wheel	8/13/1926	foundered	Walnut Street Wharf; Laverrier Cooley, Captain	1/22/1987
A.L. Bisso	Orleans	102.1	29.925	-90.135556	15	776510	3313540	1899	Steam	9/19/1947	foundered	At Walnut Street Wharf	4/29/1987
C.T. 500	Orleans	102.1	29.925	-90.135556	15	776510	3313540	1937	Barge	7/2/1955	foundered	At Walnut Street Wharf	4/29/1987
New Jennie	Orleans	102.2	29.925833	-90.135833	15	776500	3313840		Unknown	11/8/1896	burned	Foot of Broadway Street	1/16/1987
Big Louie	Orleans	102.3	29.928056	-90.135833	15	776350	3313600	1956	Steam	4/26/1958	foundered	Mile Point 6, about 100' off the left bank, near Audubon Park	4/29/1987
Radha	Orleans	102.4	29.929167	-90.135833	15	776000	3314000		Unknown	10/1/1915	sank in storm	Destroyed in a hurricane; between Magazine & Broadway	1/16/1987
Henry A. Tyler	Orleans	102.9	29.936111	-90.135556	15	776460	3314950	1883	Steam-stern wheel	12/27/1894	burned	Adams Street Wharf; renamed the 'G.W. Sentell'; salv. machinery went into the 'c	2/11/1987
AD-113	Jefferson/ Orleans	103.0	29.9375	-90.138056	15	776150	3315125		Barge	12/11/1975	collision	Length reported as 100-200', tonnage as 500-1000; vessel was 20-30 yrs old at lo	4/29/1987

Table 15, continued

BOAT NAME	PARISH	RIVER MILE	LATDEC	LONDEC	ZONE	UTM Easting (NAD 27)	UTM Northing (NAD 27)	YEAR BUILT	VESSEL TYPE	DATE LOST	LOSS CAUSE	REMARKS	DATEREC
E-826	Jefferson/ Orleans	103.3	29.941389	-90.140833	15	776000	3314850		Barge	2/11/1974	capsized	Length reported as 100-200', tonnage as 500-1000; vessel was 15-20 yrs old at lo	4/30/1987
El Vino	Orleans	104.0	29.931944	-90.136111	15	776006	3314682	1902	Tug	3/26/1945	collision	Struck amidship by a Liberty vessel; broke in half and sunk in >100' of water. N	4/30/1987

Of the 24 shipwrecks noted within the vicinity of the project area, a single vessel, the *New Jennie,* was reported as located within project area limits; an additional 9 ships (the *Wade, W.A. Williams, Frank R. Hill, Napoleon, America, Big Louie, A.L. Bisso, Radha,* and *C.T. 500*) were positioned immediately adjacent and south of the Area of Potential Effect. The remaining 14 wrecks (the *Maid of Arkansas, Piota, Randolph, Saline, Silver Heels, Victor, Yazoo, John D. Scully, William S. Nelson, Henry A. Tyler, Hazel W., El Vino, AD-113,* and *E-826*) are located some distance from the project area; however, historical documents indicate that the *Yazoo* may have sunk closer to the project area than implied by its latitude/longitude location. This underscores the locational inaccuracy inherent to the Louisiana Shipwreck database.

The *Victor* was described as a steamer built in 1917; it contained an oil screw propulsion system. Information on the *Victor* was recorded on May 5, 1987 (Clune and Wheeler 1991). In 1845, the vessel foundered at the foot of Walnut Street Wharf, which is located within the Area of Potential Effect; however, locational data supplied by the database place the wreck at Latitude 29.904167, Longitude -90.090278 in Orleans Parish, at River Mile 94.5. That is, the vessel is recorded at River Mile 94.5 but the latitude/longitude place the wreck at approximate River Mile 102.7. It is unclear if the *Victor* is located within or adjacent to the proposed project area due to the discrepancies in the historical documents and other recorded information in the Louisiana Shipwreck Database.

A grouping of eight shipwrecks was given the same locational information in the Louisiana Shipwreck Database; it was based on historical documents. They include the *John S. Scully, Maid of Arkansas, Piota, Randolph, Saline, Silver Heels, William S. Nelson,* and the *Yazoo*. All were placed at Latitude 29.931944, Longitude -90.136111 in Orleans Parish, at River Mile 101.0; again, the reported river mile and latitude/longitude are inconsistent for these vessels. Each vessel was recorded on the shipwreck database between January 14, and February 18, 1987 (Table 15); none of these shipwrecks were reported lost within the proposed project area. They are described briefly below (Clune and Wheeler 1991).

The *John S. Scully* consisted of a stern-wheel steamboat that was constructed with an iron hull in Pittsburgh, Pennsylvania in 1878. The vessel contained three boilers and a single chimney; it was reported burned and lost on August 20, 1895. Information recorded in the Louisiana shipwrecks database states that the *Maid of Arkansas* was a side-wheel steamer built in Cincinnati, Ohio in 1840. This vessel also burned before sinking on November 3, 1842. The *Piota* consisted of a wooden hulled side-wheel steamboat that was constructed in New Albany, Indiana in 1858; it was reported lost to fire on June 4, 1859. That event resulted in the death of two sailors (Clune and Wheeler 1991).

The *Randolph, Saline,* and *Silver Heels* also were characterized in the Louisiana Shipwreck Database as side-wheel steamboats. Built in 1833, the *Randolph* was renamed the *John*

Randolph on January 2, 1837. This vessel was lost when it hit a snag in the river on March 2, 1841; the accident resulted in the death of one crewmember. No other information was recorded for the *Randolph* (Clune and Wheeler 1991). The *Saline* consisted of a wooden vessel that was built in New Albany, Indiana in 1845; it foundered and sank in the vicinity of the project area on June 5, 1848. Finally, the *Silver Heels* was constructed of wood in Louisville, Kentucky ca. 1857, and it was reported lost in the vicinity of the proposed project area on October 2, 1860 (Table 15).

Additionally, the steamboat *Yazoo*, was built in Cincinnati, Ohio in 1842. Just six years later, on March 31, 1848, one of its crew died when the vessel hit a snag in the river and sank. A discrepancy between the latitude and longitude noted above for this vessel and information noted in the remarks section of the Louisiana Shipwrecks Database indicate that the vessel sank at the Walnut Street Wharf (Table 15). The last of this grouping, a stern-wheel steamer named the *William S. Nelson* also was reported lost in the project vicinity. Built in the shipyards of Paducah, Kentucky in 1856, the *William S. Nelson* sank due to a fire aboard ship in November, 1859 (Clune and Wheeler 1991).

The *Hazel W.* is described in the Louisiana Shipwreck Database as a tugboat that was powered by a diesel screw propulsion system; it was recorded on May 1, 1987 (Clune and Wheeler 1991). Its tonnage was reported as 15 to 100; however, no data were available concerning this vessel's construction. The *Hazel W.* was reported lost on March 24, 1976, and abandoned on June 17, 1976. Historical documents place the wreck at Latitude 29.92, Longitude -90.136389 in Orleans Parish, at River Mile 101.7. Locational information on the *Hazel W.* matches closely that provided from the Automated Wreck and Obstruction Information System database mentioned above.

The following nine vessels (*W.A. Williams, Wade, Napoleon, Frank R. Hill, America, Big Louie, A.L. Bisso, Radha,* and *C.T. 500*) are situated immediately adjacent to and south of the project area according to their recorded latitude and longitude coordinates (Table 15). In addition, historical documents indicate that each vessel sank in the vicinity of Broadway Street and the Walnut Street Wharf, which are located within and adjacent to the Carrollton Revetment project area, or in the vicinity of the Audubon Park Wharf, located directly south of the proposed project area. Since the locational data contained in the shipwreck database are based solely on historical documents and not field verified, it is not known how close these vessels are to the project area (Clune and Wheeler 1991).

With no recorded date of construction, the *W.A. Williams* is listed in the Louisiana Shipwreck Database as an unidentified vessel type. Information regarding this vessel is limited to the fact that it was stranded and swamped at the Audubon Park Wharf on May 4, 1899. The wreck is situated at Latitude 29.922222, Longitude -90.135833 in Orleans Parish, at River Mile 101.9. Data pertaining to the *W.A. Williams* were recorded on January 21, 1987. Also reported lost at Audubon Park Wharf was the *Big Louie*. This steamboat utilized an oil screw propulsion system, and it was built in 1956; it foundered in the area just two years later. The recorded location of this wreck is Latitude 29.928056, Longitude -90.135833 in Orleans Parish; however, the reported River Mile 102.3 does not correspond to the latitude/longitude (Clune and Wheeler 1991). Thus, its actual location cannot be determined from the Louisiana Shipwreck Database.

Destroyed in a hurricane, the *Radha* was reported lost on October 1, 1915 between Magazine and Broadway Streets (Table 15). This wreck was recorded on January 16, 1987, and it was described as being located at Latitude 29.929167, Longitude -90.135833 in Orleans Parish, at River Mile 102.4 (there is only a small discrepancy between the latitude/longitude and the river mile data). No additional information about this vessel was given by Clune and Wheeler (1991).

The *Frank R. Hill, Napoleon, Wade, America, Big Louie, A.L. Bisso,* and *C.T. 500* all were recorded in the Louisiana Shipwreck Database at Latitude 29.925, Longitude -90.135556 in Orleans Parish, at River Mile 102.1; however, there is a discrepancy between the latitude/longitude and recorded river mile for all of these vessels (Clune and Wheeler 1991). Each vessel was recorded on the shipwreck database between January 12 and January 22, and April 29, 1987 (Table 15).

Little information is available in the Louisiana Shipwreck Database for the next two vessels, the *Wade* and the *Napoleon* (Clune and Wheeler 1991). In fact, no data are available that indicate the type vessel or construction date of the *Wade*. In addition, no reason for the sinking of this vessel is provided in the Louisiana Shipwreck Database; however, it was reported lost on March 25, 1912 at Walnut Street Wharf. No description of the vessel type of the *Napoleon* was given when it struck a submerged log at the Walnut Street Wharf on June 6, 1906. It should be noted, however, that this vessel might be the same as the one called Napoleon and identified within the Area of Potential Effect; it is discussed in detail in Chapter VIII.

The *Frank R. Hill* consisted of a side-wheel steamboat that was constructed in 1905; it foundered at Walnut Street Wharf on December 24, 1907. The *America*, a stern-wheel steamboat built in 1898, had a wooden hull that was constructed in the shipyards of Jeffersonville, Indiana. It foundered on August 13, 1926 with Captain Laverrier Cooley at the helm (Clune and Wheeler 1991). A discrepancy between the latitude/longitude provided in the Louisiana Shipwreck Database and an historical map dated 1928 suggests two different locations of this vessel (Figure 136). The *America* was carrying cotton at the time of its sinking. The *A.L. Bisso* was described as a steel steamer that had a screw propulsion system. It was built in 1899, and it foundered at the Walnut Street Wharf on September 19, 1947 (Table 15). The last of this grouping, the barge *C.T. 500*, was constructed of steel in 1937. It foundered at Walnut Street Wharf 18 years later, on July 2, 1955.

The *New Jennie* is the only vessel listed in the Louisiana Shipwreck Database that is positioned within the Area of Potential Effect (Clune and Wheeler 1991). It was plotted using the documented locational information; i.e., Latitude 29.925833, Longitude -90.135833 in Orleans Parish, at River Mile 102.2. However, very little information is recorded for the *New Jennie*. According to the database, it was destroyed by fire on November 8, 1896, at the foot of Broadway Street.

A stern-wheel steamer, the *Henry A. Tyler*, also was reported lost within 0.8 km (0.5 mi) of the project vicinity. Built in the shipyards of Louisville, Kentucky in 1883, the vessel later was renamed the *G.W. Sentell*. It sank due to a fire onboard on December 27, 1894; however, the machinery from this vessel was later salvaged. This vessel's loss was recorded on February 11, 1987 at Latitude 29.936111, Longitude -90.135556 in Orleans Parish at River Mile 102.9. This inaccuracy of the locational data is marked by a difference of only 0.2 km (0.13 mi) (Clune and Wheeler 1991).

The *AD-113* and the *E-826* were described as steel cargo barges (Clune and Wheeler 1991). No data are provided for date and location of construction for either vessel; however, both sank near the Orleans and Jefferson parish line. The *AD-113* measured 30.5 to 61 m (100 to 200 ft) in length, and it held 500 to 1000 tons. It was 20 to 30 years old at the time it collided with another vessel on December 11, 1975. Clune and Wheeler (1991) recorded its location on April 29, 1987 at Latitude 29.9375, Longitude -90.138056 at River Mile 103.0. The *E-826* was 15 to 20 years old when it capsized on February 11, 1974. This barge also measured 30.5 to 61 m (100 to 200 ft) in length, with a capacity of 500 to 1000 tons. Its location was recorded on April 30, 1987 at Latitude 29.941389, Longitude -90.140833 at River Mile 103.3 (Table 15). The locational data again indicates inaccuracies; the differences between the latitude/longitude and river mile for the *AD-113* are 0.2 km (0.14 mi), and 0.5 km (0.31 mi) for the *E-826*.

Finally, the *El Vino* was identified in the Louisiana Shipwreck Database as a steel hulled tugboat built in 1902 (Clune and Wheeler 1991). It was struck amidships by a liberty vessel on March 26, 1945, breaking in half and sinking in less than 30.5 m (100 ft) of water. The recorded location was given as Latitude 29.931944, Longitude -90.136111 in Orleans Parish, at River Mile 104.0. However, based on the latitude/longitude, this vessel would actually be placed at River Mile 102.6. This tugboat is not located within the Area of Potential Effect.

Throughout the review of the Louisiana Shipwreck Database (Clune and Wheeler 1991), numerous inaccurate renderings of the shipwreck locations were noted. For the most part, the discrepancy is clearly marked when checking the latitude/longitude of the submerged vessel with the recorded river mile. This is most

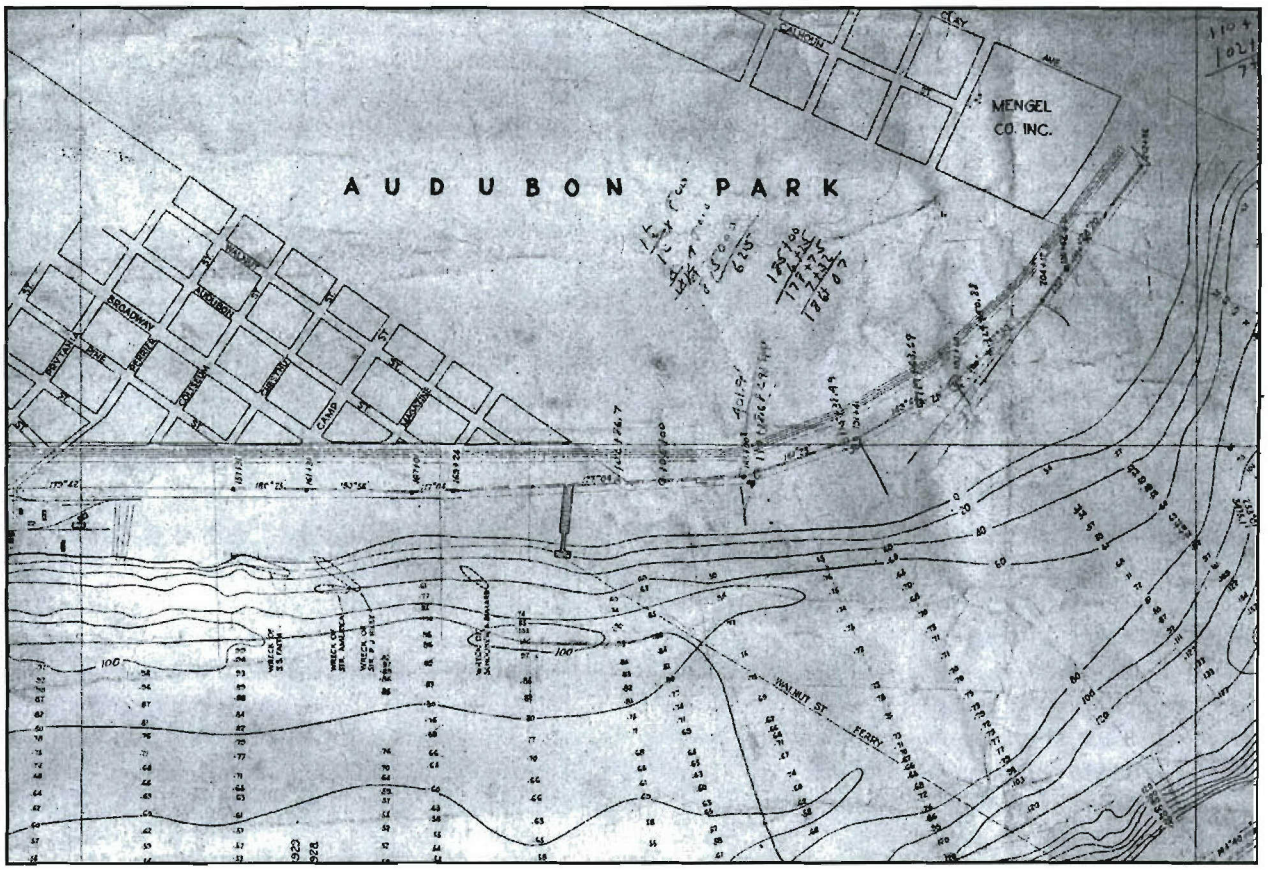


Figure 136. **An excerpt of a 1928 map of the New Orleans Harbor depicting the location of the shipwreck America in relation to the project area (University of New Orleans, Special Collections Division, War Department 1928).**

obvious with reference to the *Victor*, a vessel recorded at River Mile 94.5 with a latitude/longitude placing the wreck at approximate River Mile 102.7. In addition, the actual sinking was described as the "foot of Walnut Street Wharf," which would place the *Victor* at approximate River Mile 102.06 (Table 15).

The vessel *America* suggests another example of the inaccuracy of this database. This steamboat was reported sunk at Walnut Street Wharf. The locational data (latitude/longitude and river mile) reported on the Louisiana Shipwreck Database place the wreck just south of the proposed project area; however, a 1928 War Department map of this portion of the Mississippi River depicts the *America's* final resting place as upriver of the project area at approximate River Mile 102.5. Thus, it is unlikely that the *America* is situated within the proposed Area of Potential Effect.

Summary

A review of data currently on file at the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology and the Louisiana State Museum, Baton Rouge, Louisiana, resulted in the identification of three previously recorded archeological sites (Sites 16JE139, 16OR96, and 16OR169), 108 previously recorded standing structures (26-227 to 26-260, 26-266 to 26-279, 26-282 to 26-286, 26-288 to 26-291, 26-295, 26-299 to 26-310, 26-216 to 26-322, and 26-324), and seven National Register of Historic Places listed properties/historic districts (the Vic Pitre House, the Conrad A. Buchler House, the L. J. Bernard Hardware Store, the Ed Martin Seafood Company Factory and Home, the St. Charles Line [Streetcar], the Carrollton Historic District, and the Uptown New Orleans District) positioned within 1.6 km (1 mi) of the currently proposed project area. In addition, six previously conducted cultural resources surveys were identified within 8 km (5 mi) of this study area.

Of the three previously recorded archeological sites, two (Sites 16OR96 and 16OR169) were described as historic structural ruins that date from the nineteenth century. The remaining previously recorded site, Site 16JE139, represented the location of Seven Oaks Plantation, which dated from the eighteenth through twentieth centuries. Based on this limited information, it is possible that cultural resources representative of the eighteen through twentieth century may be found adjacent to the left descending bank of the Mississippi River. In addition, while historic standing structures are positioned within the immediate vicinity of the proposed Carrollton Revetment project area, it is unlikely that standing structures of any type will be noted during the current survey.

Finally, a review of the Automated Wreck and Obstruction Information System indicated that the waters surrounding the project area contain a single shipwreck, i.e., the *Hazel W.*, while the Louisiana Shipwreck Database compiled by Clune and Wheeler (1991) contained 24 shipwrecks within 0.8 km (0.5 mi) of the project area. These wrecks consisted of 6 side-wheel steamers (the *Frank R. Hill, Maid of Arkansas, Piota, Randolph, Saline,* and *Silver Heels*), 5 unidentified vessel types (the *W.A. Williams, Napoleon, Wade, New Jennie,* and *Radha*), 4 steamers (the *A.L. Bisso, Victor, Yazoo,* and *Big Louie*), 4 stern-wheel steamers (the *America, John D. Scully, William S. Nelson,* and *Henry A. Tyler*), 3 barges (*C.T. 500, AD-113* and *E-826*), 1 towboat (the *Hazel W.*), and a single tugboat (the *El Vino*). The variety of vessel types and the close proximity of these wrecks to the project area indicate a diverse assortment of shipwrecks potentially positioned within or in proximity to the project area.

CHAPTER VII

FIELD METHODOLOGY

Introduction

This project has incorporated in-depth historical research of the proposed project area and its surroundings; a detailed review of previously collected underwater remote sensing data provided by the U.S. Army Corps of Engineers, New Orleans District; and Phase I cultural resources survey and archeological inventory of the terrestrial portion of the proposed Area of Potential Effect. The historical background of the project vicinity, the maritime history of the adjacent Mississippi River, and the vessel types likely to be found within the underwater portion of the project area were discussed in the preceding chapters. This chapter describes the research design and field methodologies used to complete the examination of the underwater and terrestrial areas associated with the proposed Carrollton Revetment Project. It also provides information pertaining to the curation of all records, photographs, and field notes generated as a result of this investigation.

Background and Historical Research

The first step in the historical research effort included systematic identification of all the repositories, local and distant, that might hold records related to the project area. Then the volume and scope of those collections were ascertained; this essentially included a preliminary or cursory examination of the records contained within each archive or library. Finally, an exhaustive examination of all pertinent records housed by the various repositories was performed. The results of these investigations provided the basis for the history chapter of this report, as well as the identification of several of the vessels in the underwater portion of the proposed project area. This research also contributed to the formulation of significance assessments of the identified vessels and archeological deposits, as well as to recommendations for their management.

Beginning with primary research, each archive was surveyed by one or more historians. Each repository was searched by keywords, including Carrollton, Carrollton Bend, Greenville, Walnut Street, Bisso, New Orleans Coal and Bisso Towboat Company, Ferry, E. N. Bisso and Son, Victory Towing, Audubon Park, Mahalia Jackson, Buffalo Soldier, 9th Cavalry, Sedgwick Hospital, Greenville Barracks, steamboat, tugboat, batture, levee, Westwego ferry, Napoleon Street Ferry, specific vessel names, Mt. Moriah Baptist Church, and Cavalry Instruction Camp. Once the repositories and collections containing the pertinent material were identified through the keyword search, each collection was investigated extensively. Beginning with the identified targets and moving on to specific indices for each box or for each grouping, maps, correspondence, financial records, ship enrollment records, title transfers, census records, and city directories related to the foot of Walnut Street or to the Bisso commercial ventures were examined in detail.

After analysis of all identified primary material, secondary source materials were examined in order to bolster and to provide context for the primary documentary record. These sources included books and journals, vertical files, card indices, and newspapers. For these purposes, the local Orleans Parish library and City Archives were particularly useful.

Historical research associated with the proposed Carrollton Revetment project also encom-

passed many different repositories scattered throughout the United States. Due to the large volume of Louisiana records housed in New Orleans, the city served as an obvious starting point. Repositories searched in the New Orleans metropolitan area included the Louisiana State Library; the Orleans Parish Levee Board; the Historic New Orleans Collection; the Earl K. Long Archives at the University of New Orleans; the United States Army Corps of Engineers, New Orleans District; the Louisiana Division of the New Orleans Public Library; and the Louisiana Collection at Tulane University. Furthermore, the materials maintained by the Louisiana State Archives were investigated, and the records of the now-defunct Louisiana Maritime Museum, currency housed at the historic site of the U.S.S. Kidd Nautical Center in Baton Rouge, were examined for information regarding the submerged vessels identified within the underwater portion of the project area. Outside of Louisiana, records searches were performed at the Southwestern Regional Branch of the National Archives and Records Administration in Fort Worth, Texas; the Maine Maritime Museum; and the Library of Congress. Finally, taped interviews with William A. "Cappy" Bisso, III of Bisso Marine, Inc., and Archie Higgins of E. N. Bisso and Son, Inc., were conducted.

The Louisiana Collection at the Orleans Public Library was found to contain the majority of records related to the historical context of the proposed project area. The newspaper index held at that repository was examined thoroughly though keyword searches pertaining to the project area. In addition, the New Orleans City Archives, housed within the Louisiana Collection, contains records of the city, including city ordinances regarding ferry service, as well as a construction blueprint of the Walnut Street Ferry House. Sanborn Fire Insurance maps from 1909 to 1968 also are housed there, and they provided detailed information regarding historic standing structures and construction materials. The Vertical File collection at the Orleans Public Library contained documents related to batture houses of the area, and to the residents who lived alongside the Mississippi River. A collection of publications noting all Transportation Lines on the Mississippi River, collated by the United States Army Corps of Engineers, also can be found in the Manuscripts Division of the Louisiana Collection.

In addition, it was determined that the Research Center at the Louisiana State Museum held a copy of Ship Register and Enrollment Documents for vessels based in the port of New Orleans for the period 1840 to 1860, as well as the Works Progress Administration Wreck reports dating from 1873 to 1924. The United States Army Corps of Engineers, New Orleans District, holds the Annual Reports of the Chief of Engineers, which date back to 1874, and which contain information regarding improvements along the foreshore, as well as old levee maps. The Orleans Parish Levee Board maintains a rare collection of expropriated property maps detailing land ownership in the proposed project area before the 1891 levee was constructed adjacent to the project area. Both the Earl K. Long Archives at the University of New Orleans and the Louisiana Collection at Tulane University contained maps of the project area over time, while the Maine Maritime Museum, the Library of Congress, and the Southwestern Regional Branch of the National Archives and Records Administration in Fort Worth, Texas, possess records related to vessel research. Vessel enrollment documents, licenses, and the Record of Endorsements of Change of Master in Record Groups 26, 36, and 41 at the National Archives in Fort Worth provided detailed information regarding vessel size and displacement. The map collections in the Geography and Map Division at the Library of Congress yielded a number of very useful maps and paintings, some of which provided important information on early ship types, foreshore activity, docking practices, and changes that occurred along the New Orleans waterfront.

In addition, interviews with William A. "Cappy" Bisso, III, and Archie Higgins yielded vast information regarding the family businesses and the ships that were used, tied up, and eventually lost in the proposed project area. Their knowledge on the evolution of the many family companies, vessel types, and some of the changes in those ships over time were of considerable use to this study. In addition, the personal photographic and documentary collection of Mr. Bisso spans a century, and it illustrates the changes in watercraft on the Mississippi River

and other western waterways. These photographs are unpublished and are a unique and important collection in relation to a family business that has been growing and changing for over 100 years. Of particular relevance was an assessment of the assets of the company upon the death of William A. Bisso, Jr., entitled *Appraisal of Equipment Operated by New Orleans Coal & Bisso Towboat Company (in Receivership) Showing Condition and Fair Market Value as of July 2, 1963, Vol. I.* (Bachrach & Co., Inc. 1963). This document provided a great deal of documentation regarding ownership history, construction, equipment, and dimensions of a number of vessels whose enrollment documents were not recovered during other historical research. Finally, the *Marine Accident Report: French Tankership SS Sitala Collision with Moored Vessels New Orleans, Louisiana July 28, 1977* (National Transportation Safety Board 1978), provided some additional data on a number of wrecks lost in the proposed project area during that incident.

Analysis of Remote Sensing Data

During the yearly Mississippi River low water period (November 2002), the U.S. Army Corps of Engineers, New Orleans District conducted remote sensing survey of the Area of Potential Effect associated with the proposed Carrollton Revetment Project. This survey was completed between River Mile 101.6 and 102.5, and it was performed using multi-beam bathymetry and sidescan sonar. It examined the proposed revetment work area with the purpose of identifying any associated shipwrecks that may be located within the area (Figure 137). The primary instrument utilized during completion of the survey was a multi-beam system; it was employed to create a high-resolution bathymetric map of the river bottom prior to installation of the proposed revetment. In addition, a sidescan sonar survey of the proposed project area was completed as a supplement to the bathymetric data. It also was employed to assist in the identification of the possible shipwrecks noted within the study area during the previously completed bathymetric survey.

In addition, during September of 2003, the U.S. Army Corps of Engineers, New Orleans and Vicksburg Districts, jointly performed a survey of the underwater portion of the proposed project area utilizing a high-resolution acoustic imaging system developed by the Applied Physics Laboratory. The goal of this investigation was to obtain detailed images of various features of the shipwrecks that could be used in an archeological analysis and identification of the submerged targets in question. The objective of this effort was to obtain clear images of specific deck machinery, hull profiles, or hardware that could aid in assigning the shipwrecks to a known vessel from a specific time period. These underwater survey methods are described below.

Multi-Beam

Operations Division of the U.S. Army Corps of Engineers, New Orleans District provided the data collected during the multi-beam survey of the Area of Potential Effect. A Reson Seabat 8124 Multi-Beam Echosounder was utilized during this survey, and the survey boat made multiple passes over the area between levee stations 82+21 and 118+88 in order to complete detailed bathymetric survey of the river bottom. Operating at 200 kHz, the SeaBat 8124 Multi-Beam system examined a swath of the bottom that is 3.5 times the measured water depth with high-resolution, 1.5° beams. Outer beam accuracy was assured by an advanced bottom detection system. After collecting the data, a 0.6 x 0.6 m (2 x 2 ft) grid surface was extracted from the raw survey data. From these data, a three-dimensional shaded relief model of the area and of the previously identified anomalies was created. This allowed a "virtual flythrough" of the proposed project area, and it provided views of the data from various perspectives. Finally, the U.S. Army Corps of Engineers, New Orleans District furnished a completed bathymetric chart depicting 19 bathymetric anomalies that were interpreted as shipwrecks.

In terms of the data collected, and from an operational standpoint, bathymetric sonar systems estimate the distance from the shallowest point on the vessel to several points on the nearby river bottom. By computing the range from the vessel to each of these points, together with the angle between a line from each point to the vessel and the line perpendicular to the river's surface, a polar coordinate positioning of each point is obtained (Ronhovde 1999:15).



Figure 137. **Depiction of the extent of coverage provided by the previously collected remote sensing data.**

Current multi-beam echosounders use a conventional method, usually implemented as the Fast Fourier transform, to form receiving beams. The beamwidth normally is 1.5 to 5 degrees athwart ship. The sonar emits a pulse of sound, and it observes the returning echoes. Then, angles are estimated for each received echo through beamforming algorithms, and angle together with distance (time) gives the polar coordinates (Ronhovde 1999:15-19).

For the purpose of the current project, the multi-beam data provided by the U.S. Army Corps of Engineers, New Orleans District was converted into a grid plot by R. Christopher Goodwin & Associates, Inc., for additional imaging and analysis. The data were processed using Geomedia Professional 5.1 GIS software using a grid-based analytical module, GRID, to allow further spatial queries and analysis. The original data file was projected in U.S. Survey Feet coordinates based in the North American Datum 1983 State Plane Coordinate system (Louisiana South zone). During the transformation, these units were converted to the metric system using the CORPSCON software package. During this conversion, the entire X, Y, and Z file was transformed from State Plane U.S. Survey Feet to State Plane Meters; it remained based on the North American Datum 1983.

The subsequent X, Y, and Z corrected data file then was imported into the grid-based GIS analysis module. After importing the file and verifying data integrity, an inverse distance-weighting algorithm was applied to create a continuous surface display of the data. For the purposes of this exercise, the horizontal grid resolution was set at 0.3 m (1 ft). The algorithm was created using only the data in a 1.5 m (5 ft) radius from any single point; anything less created too many gaps in the surface, while any more resulted in loss of detail.

This resulted in the creation of continuous coverage of the area, with shading based on depth value; it was determined that a gray-scale palette depicted the best detail, both of the Area of Potential Effect and of the associated anomalies. This surface then was draped over the previously collected acoustic imaging data for comparison and verification, as well as to provide a more complete picture of all aspects of the individual wrecks. This process allowed analysis by taking measurements of each vessel directly from the created surface. The measurements were compared to those noted in historical documents and in the vessel typology to aid in the identification of each submerged vessel.

Acoustic Imaging

Over the past 25 years, the combined use of acoustic (sonar) and magnetic remote sensing equipment has proven to be the most effective method of identifying and assessing submerged cultural resources (Green 1990; Hall 1970). The near photographic-quality acoustic records produced by sidescan sonar systems have left little doubt regarding the identifications of some targets as intact shipwrecks. For targets lacking structural integrity or for those buried partially beneath bottom sediments, identification can be extremely difficult using acoustic imaging alone. Because intact and exposed shipwrecks are less common than incomplete and buried wrecks, remote sensing surveys generally produce acoustic targets that require ground-truthing by divers to determine their identification and historical significance.

Prior to the involvement of R. Christopher Goodwin & Associates, Inc., in the current project, the U.S. Army Corps of Engineers, New Orleans District utilized a Marine Sonics 300 kHz sidescan sonar to supplement the previously collected and described multi-beam survey data. Nautical archeologists from R. Christopher Goodwin & Associates, Inc., used the previously collected digital data, in the form of .mst files, in the current analyses. The Marine Sonics system consisted of a high-speed processor coupled with a towfish operated at a frequency of 300 kHz. This unit has a relatively moderate resolution with a theoretical maximum resolution of approximately 0.30 m (1 ft) per pixel at the 150 m (492 ft) range. Based upon available information regarding the survey methodology, which is imbedded within the digital data, it appears that a Differential Global Positioning System (DGPS) was used to correlate the sidescan towfish position to actual geographic positions. During post-processing, the positioning files were utilized to produce track plot maps and to derive the X, Y, and Z values used to analyze the bathymetric contour maps of the proposed project area.

During the sidescan sonar investigation, towfish layback, or the distance of the towfish from the differential signal antenna, was logged using Marine Sonics data collection software. When spatial analysis of the acoustic anomalies identified in the sidescan sonar data and the multi-beam data was completed, it was apparent that the layback distances were corrected, and as a result, the towfish positioning was accurate; however, due to inaccurate towfish geometry, scaled measurements taken from the data periodically are incorrect by as much as 7.6 to 9.1 m (25 to 30 ft) from the center of the multi-beam shipwrecks.

An additional error encountered during the analysis of the sidescan data was introduced when the towfish was not towed within the range of 10 to 20 percent of the total water depth above the river bottom. The optimal geometric configuration of 10 to 20 percent of total water depth off the bottom would yield the best geometric fit of the data and provide the most accurate measurements of the acoustic anomalies. As a result of the insufficient geometry between the towfish, the river bottom, and the acoustic anomaly, the resulting length and width measurements of each identified shipwreck appear to be incorrect by as much as 10 percent in water depths exceeding 12.2 m (40 ft).

Sonic Camera Imaging Experiment

In addition to the above-mentioned methods, a survey of the proposed project area utilizing a High Resolution Acoustical Imaging Camera (HRAIC) was completed. Use of this camera, which was developed by the Applied Physics Laboratory at the University of Washington for the Space and Naval Warfare Systems Center, occurred between September 16 and 18, 2003. R. Christopher Goodwin and Associates, Inc., served as archeological consultants for this portion of the project, while Lambourne Environmental Diving Service of Hiawatha, Iowa, provided diving operators to position the camera.

According to its design and operating specifications, the acoustic camera operates underwater using sound to produce near-video quality images. It has a range of 12 m (40 ft), a resolution of 2.5 cm (1 in), and 29° field of view; thus, it can produce images in water with zero visibility. The DIDSON camera measures 30 cm (11.8 in) in length by 20.5 cm (8.1 in) in height by 17.5 cm (6.9 in) in width, and it weighs only 5.4 kg (12 lbs). DIDSON operates by simultaneously transmitting and receiving sets of sound beams, which are focused using acoustic lenses (Belcher et al. 1999). Images are built in sequences of sets, or ping cycles. Therefore, the camera emits sound beams that strike the target and that are reflected back to the camera.

The camera has two operating modes: the first is a 1.0 MHz detection mode that uses four datasets to build an image with 48 beams that are 0.6 degrees apart from each other in the horizontal plane. As a result, images of objects 24 m (79 ft) away can be constructed from the camera at a resolution of 5 cm (2 in). In contrast, the identification mode operates at 1.8 MHz, and it uses eight datasets to build an image with 96 beams that are 0.3 degrees apart from each other in the horizontal plane. This results in a higher definition image that can be collected out to a distance of 12 m (40 ft) from the camera, and with a resolution of 2.5 cm (1 in) (Tiffan 2001:3).

The primary goal of this portion of the underwater investigation was to examine the utility of the high-resolution acoustic imaging system being tested by the Information Technology Laboratory (ITL) of the Vicksburg District in a marine archeological application. As such, divers were tasked with imaging specific features of shipwrecks in the Area of Potential Effect that could be used in archeological analysis of the submerged targets.

During this exercise, a tethered diver operated the sonic camera. The camera's 45.7 m (150 ft) long cable was tied into the diver umbilical and extended to the camera processor on deck. The on-deck consulting archeologist and camera operators viewed images on two separate computer monitors and provided the diver with directions via the hard-wired diver communications system to control camera movement. The diver had no camera display, and was dependent on instructions from the surface. Furthermore, it should be noted that for best results, the diver-operated camera must be positioned at least 4 m (13 ft) from the target to render clear images.

In addition to zero visibility conditions, the survey was complicated by the presence of

underwater obstructions and debris that frequently tangled the diver's umbilical and that contributed to diver disorientation. In order to overcome this problem on subsequent dives, a travel line was rigged to a piece of rebar. When the diver identified a target that needed to be imaged, the diver drove the rebar into the riverbed next to the target and backed away to premeasured points in the line, e.g., at 4 m (13 ft), 14 m (45 ft), and 18 m (60 ft) distances. At each point in the line, the diver directed the camera at the target by pointing the camera along the direction of the travel line. The collected data then were transmitted to the shipboard computer and processed to form an image of the examined vessel or feature (Figure 138).

This camera's potential in archeological applications has yet to be fully tested and developed. This technology should be tested in a clear water environment such as the Florida Keys where good visibility would permit a diver to easily orient himself to a target vessel. Procedures for the use o the camera in conjunction with a baseline established parallel to a target wreck should be developed. Making the camera stationary using a tripod at intervals along the baseline should improve the quality of the data recorded. A hand held unit will always be affected by minor motions of the diver in a manner similar to long exposure photographs using a handheld camera on land. Leveling the unit in either horizontal or vertical planes also would improve data quality. Tilting the camera or panning rather than movement up and down or side to side will always introduce error. If a rigid rectangular frame were built such that the camera could be made to smoothly travel vertically and horizontally in the same plane, one might be able to make very accurate images of a target in any application of this technology. After these procedures are developed and tested in waters with good visibility the conic camera may be more successfully used in archeology and other applications in poor or zero visibility environments.

Though originally four targets were selected for examination, navigational issues, camera operation, and diver bottom time constraints restricted diving to two sites only. The sites selected for examination were the schooner *Addison E. Bullard* (Shipwreck #1) and the *USS Chickasaw/Goldsboro* (Shipwreck #2). The results of this portion of the underwater investigation are described below.

Description of the Terrestrial Portion of the Project Area

The terrestrial portion of the Carrollton Revetment Project was located on the Mississippi River levee batture within Section 14 of Township 13S, Range 10E. The terrestrial portion of the Area of Potential Effect measured between 10 and 37 m (32.8 and 121.4 ft) in width (depending on the width of the remaining bankline and the exposed shoreline) by approximately 768.5 m (2,521.3 ft) in length. Vegetation within the project area consisted primarily of secondary growth and underbrush intermingled with areas of manicured lawn. The majority of the project area, however, contained graveled surfaces, modern debris, heavy equipment, riprap, and evidence of other erosion control measures. Current land use within the proposed project area is both commercial and public; that is, 75 percent of the Carrollton Revetment Project area is utilized by the Bisso family for marine salvage and towboat facilities. The remaining 25 percent of the Area of Potential Effect consisted of a portion of Audubon Park.

During survey, the terrestrial project area was divided into areas (A through D) to provide better survey coverage; property lines served as area boundaries (Figure 3). Area A consisted of a portion of Audubon Park, locally known as the "Butterfly." Area B was within the limits of the Bisso Towboat Company, Inc.; it was flanked by Audubon Park to the south and by the adjacent property of E.N. Bisso and Sons, Inc., to the north. The previously mentioned E.N. Bisso and Sons, Inc., property was identified as Area C, and it was located south of Bisso Marine Company, Inc. The Bisso Marine Company, Inc., holdings comprised the largest of the properties within the Area of Potential Effect; it was identified as Area D (Table 3). While each area is described in detail elsewhere in this report, the methods used to test them are discussed below.

Project Area Mapping

In order to produce a detailed map of the proposed project area and its environs, a topographic survey was completed using a TOPCON

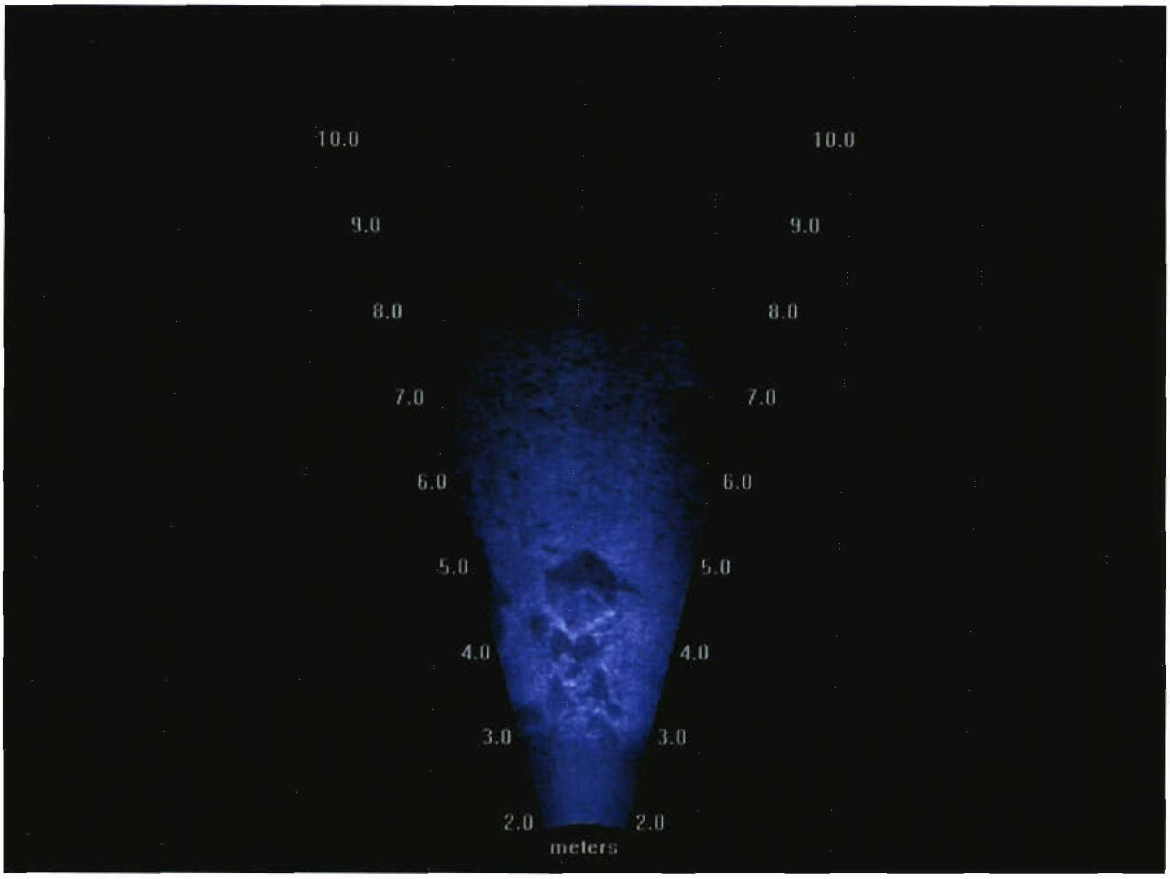


Figure 138. **A sonic camera image of a toolbox or steamer trunk that was taken within the project area during the preliminary test dive.**

GTS-303 5 Electronic Distance Meter (EDM), coupled with a Hewlett-Packard 48GX Data Collector with a Tripod Data Systems Surveying interface; however, the data also were recorded manually to guarantee their retention. An arbitrary datum, labeled N1000 E1000, was established on the extant levee within Area A. Then, a baseline was established along the crown of the extant levee with control points placed every 50 m (164 ft). This baseline extended from north to south, parallel to the Mississippi River. Elevations were taken perpendicular from the levee control points (from the Public Belt's railroad tracks that extend along the entire length of the project area to the east and west to the bank of the Mississippi River). Finally, the datum was tied to a temporary benchmark established by the U.S. Army Corps of Engineers, New Orleans District, and situated within the batture. This temporary benchmark provided an elevation of 7.4 m (24.52 ft); all elevations discussed in this document were tied to this measurement.

Pedestrian Survey

Pedestrian survey of the Area of Potential Effect included visual inspection of the ground surface along the length and width of each survey transect. In addition, the eroding bankline was examined for artifacts and evidence of cultural features. Pedestrian survey was hampered by the large amount of artificial fill used to stabilize the batture within portions of the Area of Potential Effect. A variety of temporally diagnostic artifacts were recovered during this visual reconnaissance, and they were collected to assess the relative age of the secondary fill episodes; however, they do not represent intact archeological deposits.

Auger Testing

Auger testing also was performed throughout the Area of Potential Effect at 15 m (49.2 ft) intervals along two parallel transects spaced approximately 10 m (32.8 ft) apart. The auger tests were excavated in an attempt to identify any intact soil stratigraphy or buried cultural deposits (Table 3). The survey transects were oriented in a north/south direction, and they generally followed the shoreline of the Mississippi River. Due to the nature of the project area, a single survey transect (TR 1) was situated along the lower shoreline; the second transect (TR 2) was positioned on the upper bankline. A 110 m (360.8 ft) long segment of the northern portion of Area D (Bisso Marine) only allowed placement of a single transect due to the precipitous slope of the landform and to the inability of the field crew to safely access the lower shoreline; thus, the single transect was positioned along the upper bankline.

Each auger test was excavated by hand using a 6.35 cm (2.5 in) diameter "Dutch" auger to an approximate depth of 2 m (6.6 ft) below surface, or until water or impenetrable deposits hindered the excavation process. Each auger test was excavated in 20 cm (7.9 in) levels within natural strata, and the fill associated with each level was screened through 0.64 cm (0.25 in) hardware cloth. Extremely wet soils and clay were hand-sifted, troweled, and examined visually for cultural material.

A stratigraphic soil profile for each auger test was recorded, and soil characteristics were characterized in the field using Munsell Soil Color Charts and standard soils nomenclature; minimal pedological characteristics recorded during survey included soil color and texture. All auger tests were backfilled immediately upon completion of the archeological recordation process. As a result of this investigation, a total of 62 of 69 (90 percent) planned auger tests were excavated successfully within the terrestrial portions of the Area of Potential Effect. The remaining seven unexcavated auger tests fell in areas covered by riprap and/or heavy equipment.

Backhoe Trenching

Where applicable, backhoe trenches were excavated at 10 and 20 m (32.8 and 65.6 ft) intervals along a single transect that extended through portions of Areas A and B, respectively (Table 3). A total of 12 of 12 (100 percent) planned backhoe trenches were excavated successfully within these areas. Due to the heavily modified conditions within Areas C and D, these areas were excluded from backhoe trenching. For example, in Area C the Area of Potential Effect was extremely narrow (i.e., it measured approximately 10 m [32.8 ft] wide), and the bankline was unstable; thus, it did not provide

adequate space for a backhoe to maneuver safely. In addition, Area D was inaccessible to the backhoe due the presence of heavy equipment and debris from marine salvage operations, as well as of deposits of cement and gravel fill located along the bankline in this area.

Each backhoe trench measured approximately 1.5 x 3 m (4.9 x 9.8 ft) in size, and each was excavated to an approximate depth of 200 cmbs (78.7 inbs), or until the influx of water or the presence of immovable debris (i.e., large cement slabs) hindered the excavation process. Excavation of each backhoe trench proceeded in 20 cm (7.9 in) levels within natural strata. Screening of trench fill was not attempted; rather, monitoring of the trench excavation and visual examination of the resultant spoil piles were undertaken. Once fully excavated or when groundwater or immovable debris was encountered, all backhoe trenches were profiled, with the vertical location of all soil breaks and cultural materials were plotted accordingly. Profiling proceeded from the surface of each backhoe trench. Munsell Soil Color Charts were used to record soil color; texture and other identifiable characteristics also were recorded. Finally, all of the backhoe trenches were photographed after excavation was completed. Photographs were taken using both digital and color film media. All backhoe trenches were backfilled immediately upon completion of the archeological recordation process.

Architectural Review and Standing Structures Recordation

As part of this Phase I cultural resources survey and archeological inventory, the survey crew also was instructed to record all standing structures older than 50 years in age located within the study area. The purpose of this architectural recordation was to collect reconnaissance-level architectural survey data for each building older than 50 years in age located within the study area. Architectural investigations were undertaken in accordance with guidelines established in *National Register Bulletin 24: Guidelines for Local Surveys: A Basis for Preservation Planning* (National Park Service 1995). As a result of this survey, no historic - standing structures were identified within or adjacent to the proposed Areas of Potential Effect. Several historic objects, however, were noted outside of the limits of the Area of Potential Effect. They were noted for their historical importance to the study area as a whole, and they are discussed in the following chapter.

Laboratory Analysis

Laboratory methods were designed to ensure that all materials recovered during fieldwork were processed appropriately and efficiently. Cultural material was collected throughout the Area of Potential Effect to verify the age range of fill deposits contained within the proposed project reach. The artifact analysis consisted of recording a series of observations for each specimen. Data processing and the analysis of the resulting identifications and observations were performed using Microsoft Access and Microsoft Excel. A single database was constructed to record, organize, and manipulate the different analytical information required for the materials analyzed.

Historic/Modern Material Analysis

Initially, the analysis of the historic/modern cultural material was divided into separate databases by material and type, e.g., metals, ceramics, glass, and other. Class, functional group, type, and subtype further organized these artifact groups. The first level, class, represented the material category, e.g., whiteware, and iron. The second level, functional group, e.g., construction, kitchen, or personal, was based on classifications established by South (1977). The third and fourth levels, i.e., type and subtype respectively, described temporally or functionally diagnostic artifact attributes. Historic ceramics were described further by noting predominant decoration type and color, as well as the portion of the vessel represented. Artifact identification was aided by consulting standard reference works, including Fike (1987), Florence (1990), Jones and Sullivan (1989), Kovel and Kovel (1986), Miller (1980, 1991), Nelson (1968), South (1977), Toulouse (1971, 1977) and Wilson (1981).

Curation

Although temporally diagnostic cultural materials were recovered during this visual investigation, they were collected to assess the relative age of the secondary fill episodes and do not represent intact archeological deposits. Still, the cultural assemblage was assigned Louisiana site number 16OR181; this material, final report, records, photographs, and field notes will be curated with:

State of Louisiana
Department of Culture, Recreation, and Tourism
Division of Archaeology
P.O. Box 44247
Baton Rouge, Louisiana 70804-4247
(225) 342-8170

In the curation facility located at:

Galvez Building, Room B-023
602 N. Fifth Street
Baton Rouge, LA 70802
(225) 342-4475

CHAPTER VIII

RESULTS OF INVESTIGATION AND RECOMMENDATIONS

Introduction

This chapter presents the results of Phase I cultural resources survey and archeological inventory of the underwater and terrestrial portions of the proposed Carrollton Revetment project reach. As noted above, the underwater portion of the proposed project area measured approximately 768.5 m (2,521.3 ft) in length, and it ranged between approximately 128 to 155 m (420 by 508.5 ft) in width, depending on the width of the exposed shoreline during low tide. It extended from River Mile 101.6 to River Mile 102.5. The terrestrial portion of the proposed project reach encompassed an area 768.5 m (2,521.3 ft) in length; it ranged between 10 and 37 m (32.8 and 121.4 ft) in width, depending on the amount of exposed shoreline resulting from daily fluctuations in the river level. The testable portions of the terrestrial area totaled approximately 1.56 ha (3.86 ac) in extent.

Background Research for Submerged Portion of the Proposed Project Area

As mentioned above, a total of 19 shipwrecks were identified during analysis of remote sensing data collected by the U.S. Army Corps of Engineers, New Orleans District. For the purposes of this investigation, an attempt was made to correlate these shipwrecks with those recorded in historical documentation, as well as with the Louisiana Shipwreck Database. In addition, a series of informant interviews were conducted with members of the public thought to have specific knowledge about the wrecks, and especially with William A. Bisso, III, of Bisso Marine Inc. The Official Records of the Union and Confederate Navies in the War of the Rebellion; the National Transportation Safety Board's Marine Accident Report on the *Sitala* collision; the 1963 Appraisal of Equipment Operated by New Orleans Coal & Bisso Towboat Company; the Database of Louisiana Shipwrecks (Clune and Wheeler 1991); aerial photographs; and the Record of Enrollments from the Port of New Orleans covering six decades (1950 to present), also provided useful information.

Detailed analysis of enrollment records proved to be very helpful because they are the primary means by which the government kept track of U.S. flagged vessels. The information contained within enrollment documents included the date and place of the vessel's construction, the material from which it was built, its dimensions, and its owner(s). Further, if a vessel was sold, it had to be re-enrolled under the new owner(s), and the previous document was surrendered. Similarly, if the vessel was moved to another port, it had to be enrolled in the new district following surrender of its previous enrollment document. In addition, every six years vessels were re-enrolled as a matter of course.

As in all documentation, the above-referenced records were created and curated by a variety of different individuals and institutions; therefore, they contain errors, or in some cases, the pertinent records are now missing or lost. In a few instances mentioned below, enrollment documents were located for a particular vessel from the period pre-dating ownership by the various Bisso entities; however, no documents were found that confirmed ownership of the vessel by either of the Bisso companies. An examination of this documentation suggests that vessel names tended to be relatively unique.

During this study, some overlap of enrollment documents or different owners of similarly named vessels was found (the *Napoleon*). In the one case where definitive proof of two vessels with the same name occurred, i.e., the *Mary B*, they were the property of the same owner - the New Orleans Coal & Bisso Towboat Company. The first vessel had been reported as sunk by the Bureau of Navigation as a total loss at Belle Point on the Mississippi River on March 21, 1906. The second vessel was named in honor of the first, and it sank within the proposed project area. It is discussed below.

Concurrent with the enrollment document, a licensing system also was in place. In the 1930s, these licenses were combined with the enrollment document and renewed or endorsed on an annual basis. In all cases, whether the vessel was a tugboat or a railway ferry, each was issued a one-year license to participate in the "coastal trade."

A number of the vessels described below were reported lost within the project area by William A. "Cappy" Bisso, III, the current owner and president of Bisso Marine Inc. Mr. Cappy Bisso has spent most of his life working in the marine business on the Mississippi River batture (William A. Bisso, III, personal communication: October 13, 2003). He worked on and was familiar with a number of the vessels now reported as sunk within the project area. In addition, a number of vessels were identified on the Database of Louisiana Shipwrecks as having sunk in the vicinity of the project area (Clune and Wheeler 1991). Chapter VI briefly described 24 additional shipwrecks that may be in the vicinity of the project area. The following discussion reviews, insofar as possible, the names, descriptions, and dimensions of vessels presumed lost within the underwater portion of the Area of Potential Effect.

Site 16OR189 (Shipwreck #1; *Addison E. Bullard*)

Shipwreck #1 was identified at approximate River Mile 102.36, adjacent to the left descending bank of the Mississippi River (Figure 139). The vessel is located at UTM coordinates N3314116, E776490, at an approximate river depth ranging from 9 to 23 m (29 to 71 ft). Analysis of the previously recorded remote sensing data indicated that these remains consist of a wooden sailing craft measuring approximately 61 to 64 m (200 to 210 ft) in length, with a beam of 12 to 15 m (40 to 50 ft) (Figure 140; Table 16). Currently, the vessel is listing over on its port side; it is positioned diagonally across the submerged riverbank, with the stern downriver in deeper water. A large area of damage at port midships, and running forward, is suggestive of a collision event; this could account for the list to port on the riverbed (Figure 141). In addition, the multi-beam and sidescan sonar data depict considerable damage to the bow; a line of pilings were set in the river parallel to the bank at some point in the past, and driven through the bow of the schooner (Figure 142).

Prior to acoustical imaging of Shipwreck #1, a diver performed a reconnaissance of the shipwreck, following the starboard side of the wooden hull. While some gaps were present between the planking, the hull generally was described as in good condition. The list of the vessel to port exposed the bilge. Proceeding to the shallower section of the bow, the diver encountered a round stump that constituted pilings driven through the forward section of the wreck (Figure 142). Additional investigation indicated that the vessel's entire deck was missing, suggesting that the deck and bow of the schooner may have been cleared in order to facilitate passage of a work barge during piling emplacement; thus, no deck structures or equipment were present.

Acoustical imaging of Shipwreck #1 resulted in little additional detail of the vessel. Images of the hull confirmed that it was relatively intact. Investigation of the starboard bow, near the sediment line, produced a very clear image depicting the "V" shaped bow of the vessel taken from a frontal prospective (Figure 143). Further attempts to examine the entire structure acoustically indicated that the upper works were disturbed and disarticulated; they were represented by a series of disorganized weak returns and voids in the camera images. Thus, the accuracy of these interpretations is supported by both multi-beam bathymetric data and diver investigation, although no clear image was obtained of the aft section of the vessel.

Use of the camera also resulted in the collection of a series of images of the starboard and port sides of the vessel. Following horizontal, or normal, scanning of the starboard hull, a void in

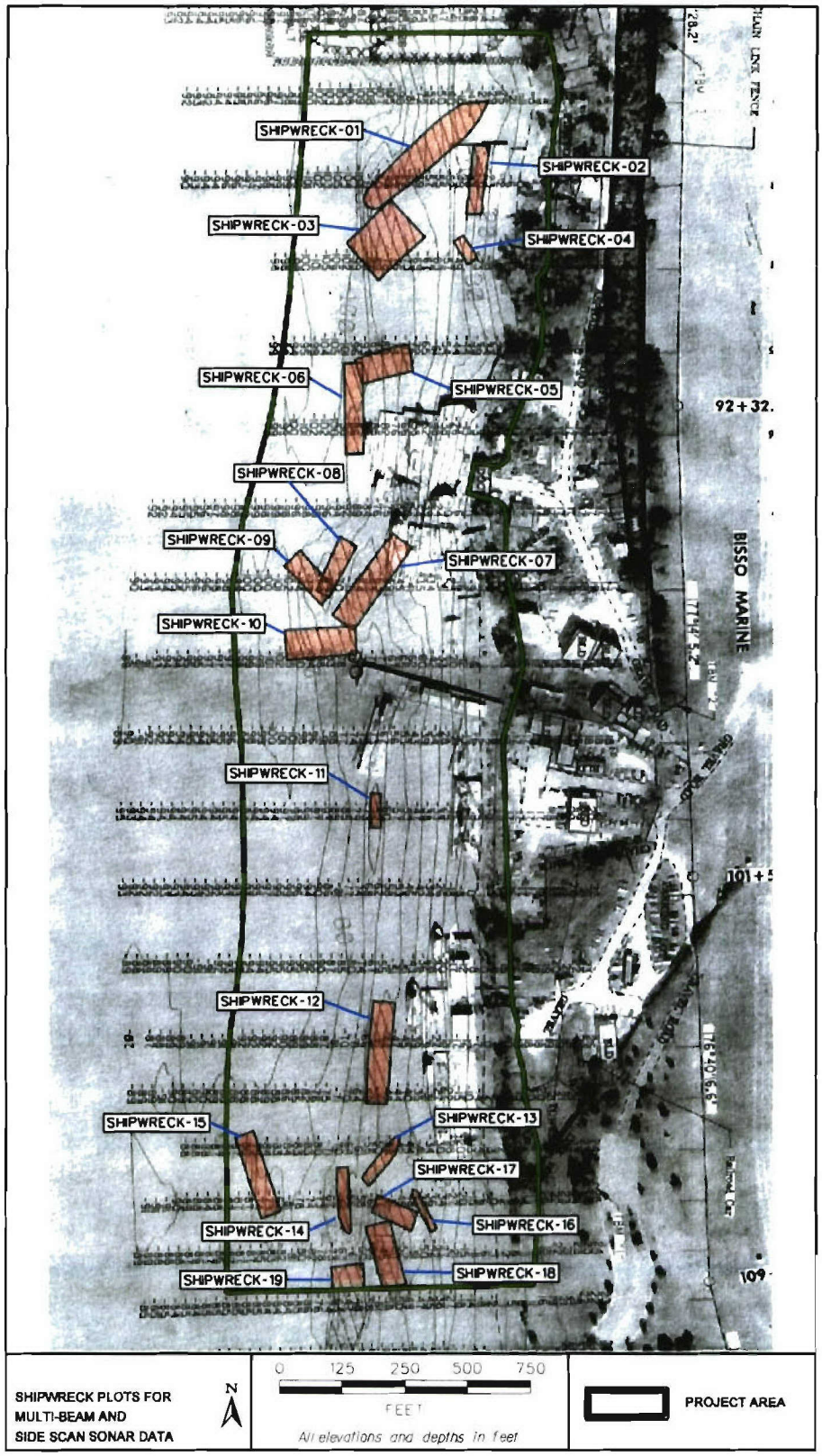


Figure 139. **Project Area with Multi-Beam and Side Scan Sonar Shipwreck Plots.**

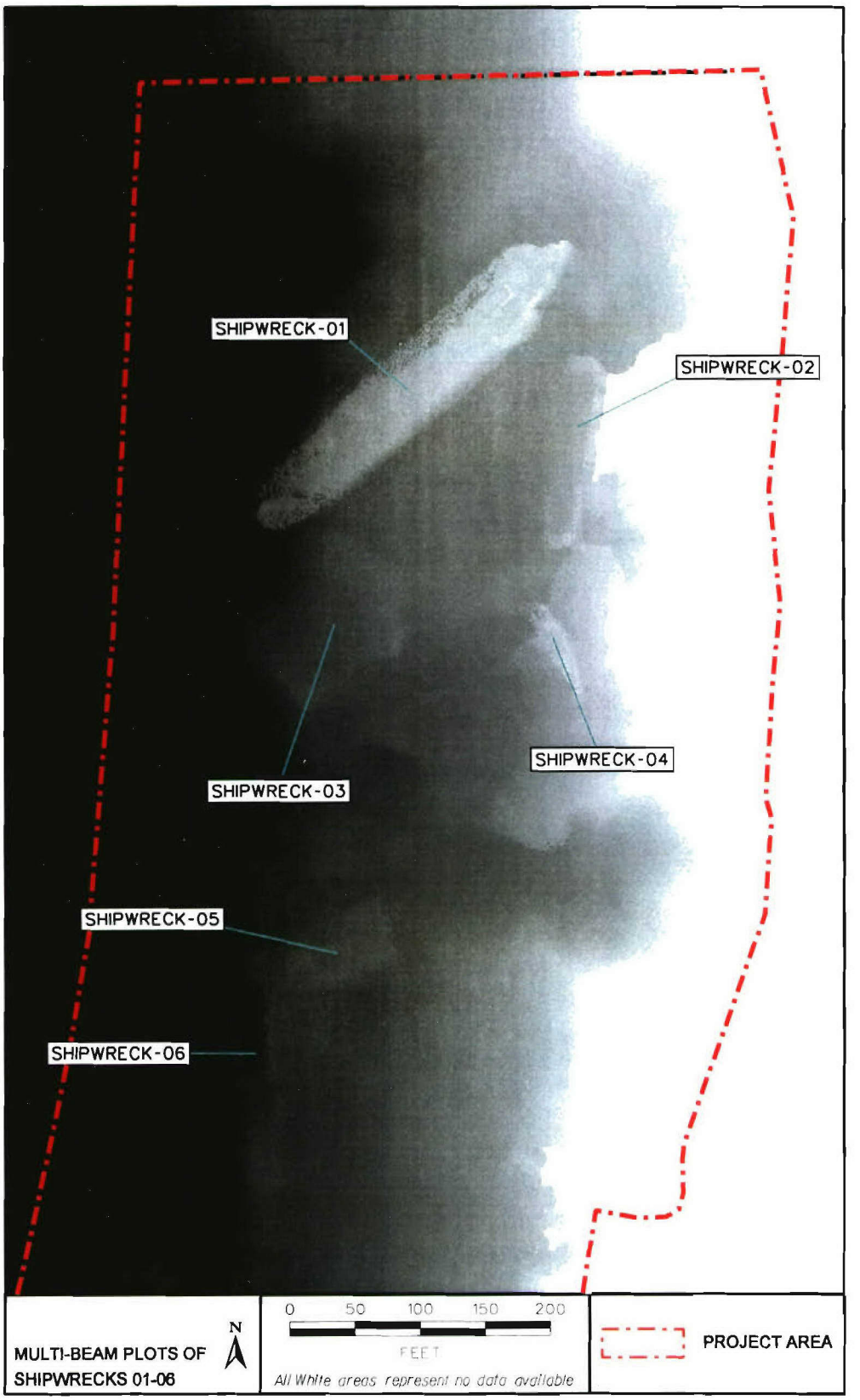


Figure 140. Multi-Beam Grid Plot of Shipwrecks #1 – #6.

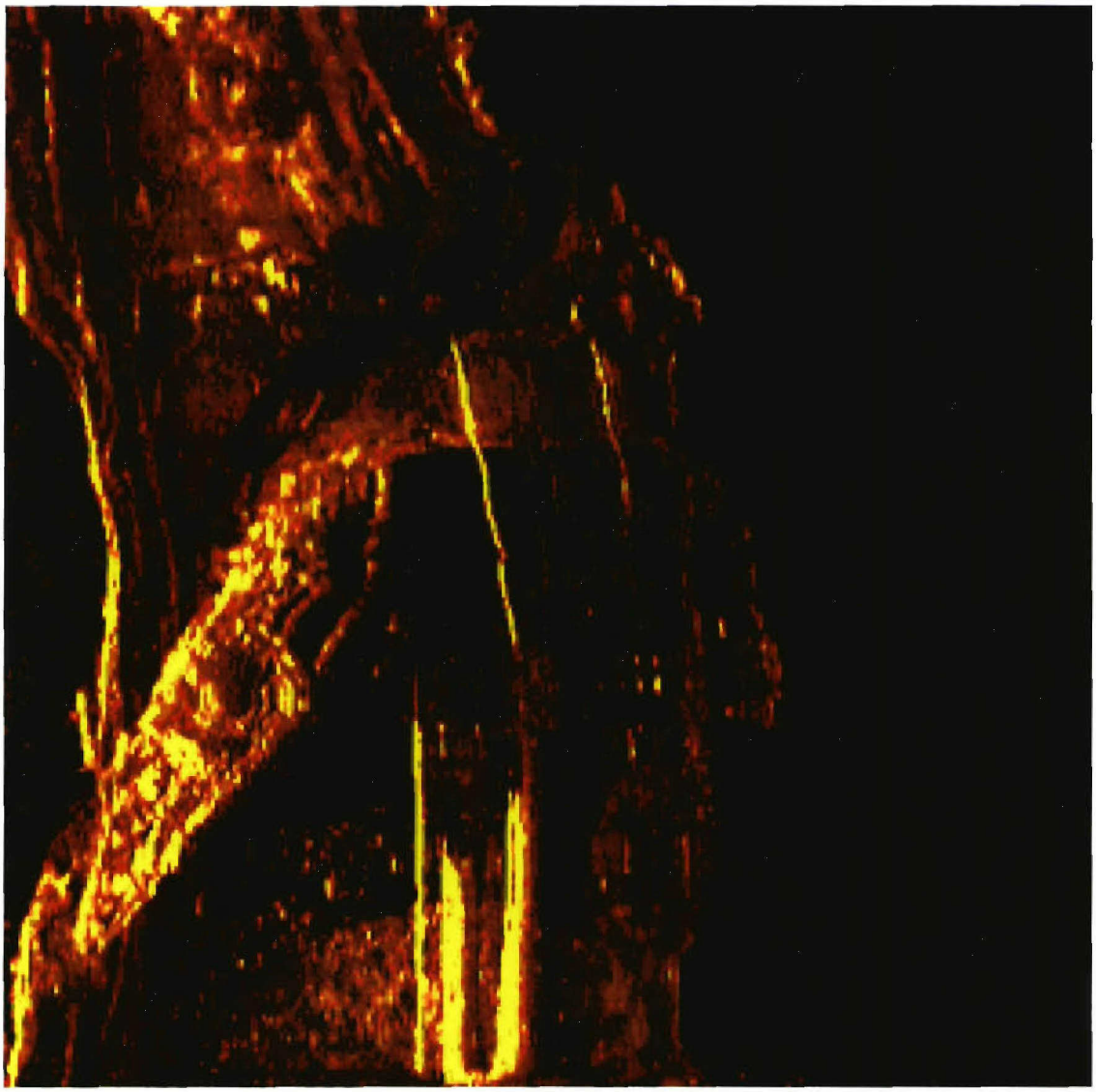


Figure 141. Side Scan Sonar Image of Shipwreck #1 (*Addison E. Bullard*).

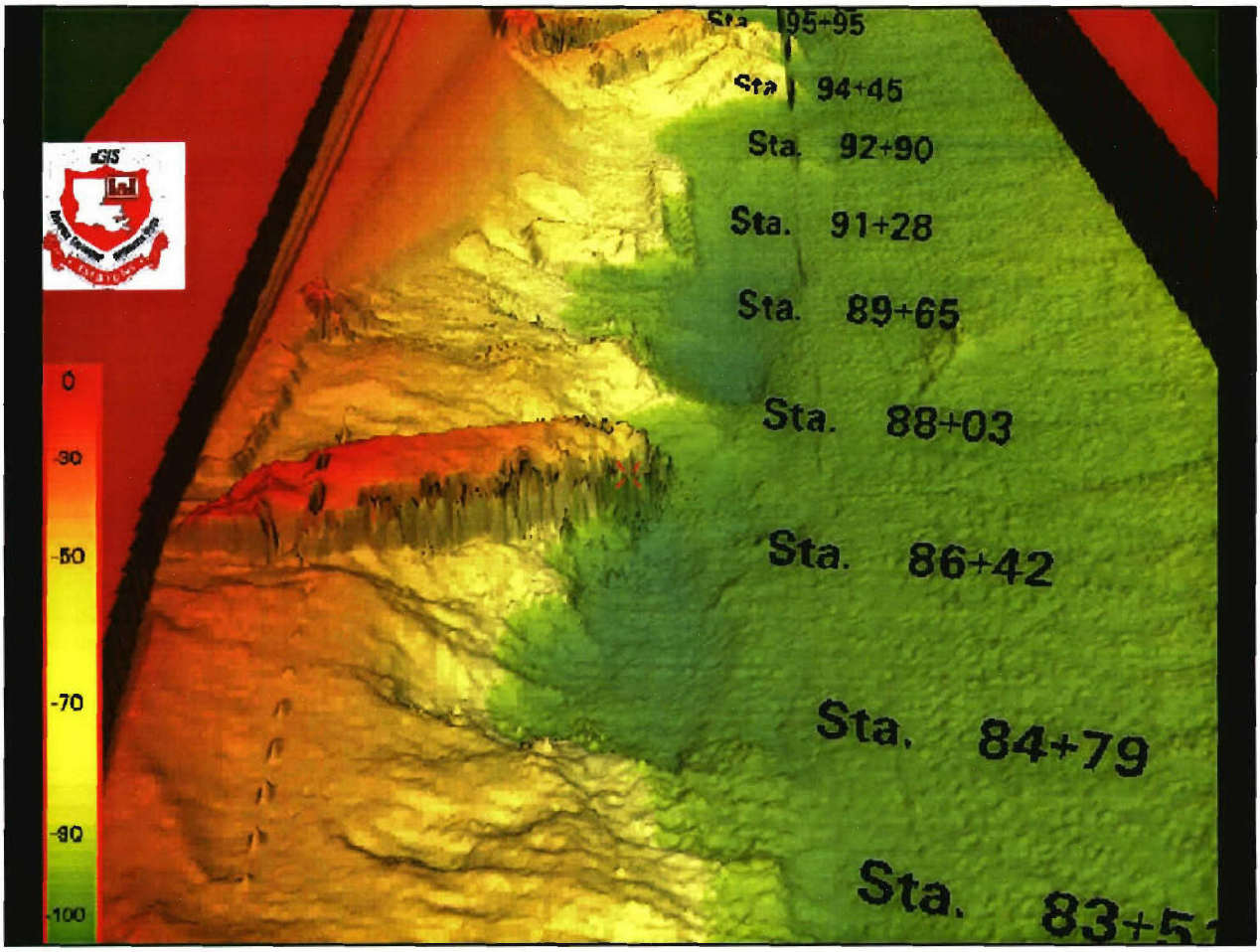


Figure 142. **Multi-beam image showing a line of pilings across the *Addison Bullard's* bow.**

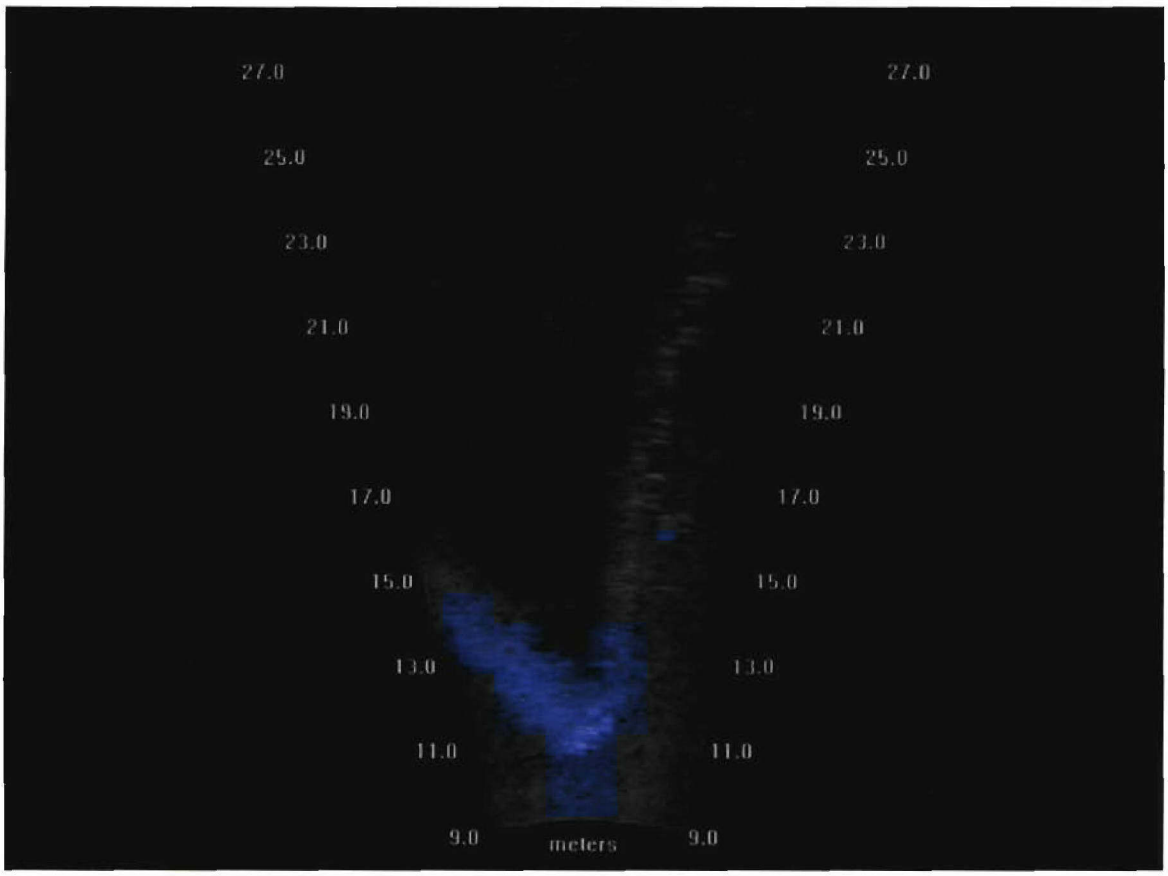


Figure 143. **Sonic camera image of the *Addison Bullard's* bow.**

Table 16. Shipwrecks in the Carrollton Bend Project Area.

Side Scan File	Wreck No.	lat WGS 84	long WGS 84	Northing LA State Plane Srvy Ft NAD 83	Easting LA State Plane Srvy Ft NAD 83	Side Scan Length (ft)	Side Scan Width (ft)	Multi Beam Length (ft)	Multi Beam Width (ft)	Comment
1110F121	1	29.554284	-90.080906	521496.9	3660139.6	210	40+	309	42	*Addison Bullard*
1110F124	1	29.55429	-90.080936	521502.7	3660113.1	203	50	309	42	*Addison Bullard*
1110F124	2	29.554236	-90.080834	521449.1	3660203.4	160	48	143	34	*Gouldsboro/Chickasaw*
N/A	3	29.554068	-90.081025	521277.5	3660037.1	N/A	N/A	100	50	Possible Crane *Boaz*
1110F124	4	29.554044	-90.080858	521254.9	3660184.3	50	15	66	18	*Rooster/ Samson/ Napoleon*
1110F120	5	29.553822	-90.081008	521029.3	3660054.7	75	54	96	48	Possible Crane *Ajax*
1110F124	5	29.553834	-90.081038	521041.2	3660028.2	80	55	96	48	Possible Crane *Ajax*
1110F124	5	29.553876	-90.081032	521083.6	3660033.0	89	18	96	48	Possible Crane *Ajax*
1110F120	6	29.553738	-90.081068	520943.9	3660002.8	163	34	175	30	Possible Navy vessel
1110F124	6	29.553744	-90.081092	520949.8	3659981.6	183	22	175	30	Possible Navy vessel
110F105	7	29.553432	-90.08102	520635.3	3660048.3	211	40	230	40	*E.N.B. Barge 535*
110F105	7	29.553492	-90.081002	520696.0	3660063.5	30	20	230	40	*E.N.B. Barge 535*
1110F120	7	29.553414	-90.081026	520617.0	3660043.2	220	40	230	40	*E.N.B. Barge 535*
1110F120	7	29.553228	-90.080906	520430.3	3660150.7	220	40	230	40	*E.N.B. Barge 535*
1110F123	7	29.553402	-90.081044	520604.7	3660027.5	224	42	230	40	*E.N.B. Barge 535*
1110F123	7	29.553456	-90.081002	520659.7	3660063.8	210	32	230	40	*E.N.B. Barge 535*
1110F120	8	29.553432	-90.081116	520634.4	3659963.8	118	20	120	25	*Boswell/ Eclipse/ John S. Lanier*
1110F123	9	29.553444	-90.081128	520646.4	3659953.1	128	30	130	40	Possible NY Ferry/ Unnamed Tank Barge
N/A	10	29.553307	-90.081174	520507.4	3659914.2	N/A	N/A	80	40	
N/A	11	29.552999	-90.080997	520198.6	3660072.7	N/A	N/A	120	60	Ferry *A.M. Halliday*
110F111	12	29.552508	-90.08099	519702.2	3660084.4	198	40	200	35	Unknown
1110F116	12	29.552514	-90.080984	519708.3	3660089.6	210	35	200	35	Unknown
1110F116	13	29.552286	-90.080984	519478.0	3660092.0	120	24	123	23	*Mary B*
110F111	14	29.552226	-90.08108	519416.5	3660008.2	74	18	130	25	*Tyler*
1110F116	14	29.552196	-90.081068	519386.3	3660019.1	110	27	130	25	*Tyler*
110F111	15	29.552292	-90.081266	519481.5	3659843.8	100	38	N/A	N/A	Landing Ferry
1110F116	16	29.552166	-90.0809	519357.6	3660167.2	100	31	N/A	N/A	Unknown
110F111	17	29.55219	-90.081002	519380.9	3660077.2	100	30	N/A	N/A	Unknown
1110F116	17	29.552136	-90.08093	519327.0	3660141.1	60	25	N/A	N/A	Unknown
1110F116	18	29.552118	-90.080996	519308.2	3660083.2	60+	50	N/A	N/A	Unknown
111F110	19	29.552028	-90.08108	519216.5	3660010.3	90	20	N/A	N/A	Unknown
111F110	19	29.552052	-90.081044	519241.1	3660041.7	60	50	N/A	N/A	Unknown
111F110	A	29.55207	-90.081104	519258.7	3659988.7	14	14	N/A	N/A	Boiler
111F110	B	29.552028	-90.081146	519215.9	3659952.2	14	14	N/A	N/A	Boiler

the upper-works revealed a vertical rent or fracture in the hull (Figure 144). Horizontal scanning with the camera indicated that the port side of the vessel had less vertical profile than the starboard side, most likely due to the vessel's list to port. Vertical scanning also revealed part of the vessel's stem, well below the hard return for the sediment line along the hull, indicating that a current scour has developed in that area. Finally, several tires were identified from an image of the port side of the hull.

Analysis of the remote sensing data, diver investigation, historic documentation, and oral history indicate that this vessel represents the remains of the four masted schooner identified as the *Addison E. Bullard* (Figure 145). The schooner *Addison E. Bullard*, official No. 201527, was built in the Carleton, Norwood & Co., shipyards of Rockport, Maine; it was launched on November 10, 1904 (Nathan R. Lipfert, personal communication: October 24, 2003). Historical documentation revealed that the vessel measured 66.6 m (218.6 ft) in length, with a 13 m (42.7 ft) beam. Its depth was 6.1 m (19.9 ft), and it was crewed by nine men. These measurements correspond to the remote sensing data. The vessel had a gross tonnage of 1,485 and a net tonnage of 1,223.

E.C. Worden of St. Johns, New Brunswick captained the *Addison E. Bullard*. A photograph taken in Galveston, Texas, depicts the *Addison E. Bullard* being assisted by a steam tug on its starboard stern (Figure 146). Also depicted in the background is a barge with a deck structure; what appears to be a dredge is in the right background. The schooner was involved in the Gulf trade, traveling from New Orleans to Oporto, Portugal under the ownership of Horace Turner (Ship Register and Enrollments of New Orleans n.d. [ca. 1860]). On October 2, 1919, the *Addison E. Bullard* was enveloped in flames approximately 16 km (10 mi) off of South Pass, at the mouth of the Mississippi River; the fire caused $150,000.00 damage.

It is not clear when the Bisso family obtained the ship, but eventually the *Addison E. Bullard* ended up in New Orleans, where it was tied up in the current project area. A close examination of Figure 147 depicts the *Addison E. Bullard* in the process of being un-rigged. Its topmasts have been struck and the foremast removed. Perhaps like the unrigged vessel to which it was moored, the *Addison E. Bullard* was being converted to use as equipment storage, workspace, and mooring post. This figure also depicts fleet mooring practice in the proposed project area in the early twentieth century.

Site 16OR189 (Shipwreck #1) was identified as the early twentieth century schooner the *Addison E. Bullard*. Investigations did not determine precisely when the ship sank, except that a 1928 War Department map shows it as sunken at that time. The *Addison E. Bullard* is one of many schooners built in Maine at the turn of the century, and as such, it is a common ship of a type that has been well documented. As noted above, with the partial exception of its hull, the original fabric of the vessel has been lost either to fire or to intentional removal during its conversion to a platform. As a result, the shipwreck lacks both research potential and integrity. It is not the work of a master, or a good example of style or period of construction. The remains of the *Addison E. Bullard* do not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional work is recommended for this vessel.

Site 16OR190 (Shipwreck #2; *Chickasaw/ Gouldsboro*)

Shipwreck #2 also was identified adjacent to the left descending bank of the Mississippi River, at approximate River Mile 102.36 (Figure 139). The UTM coordinates N3314403, E776523 positions the vessel at a water depth ranging from 9 to 13 m (31 to 43 ft). Analysis of the previously recorded remote sensing data indicates that Shipwreck #2 measured approximately 49 m (160 ft) in length, with a beam of 14.6 m (48 ft) (Figure 140; Table 16). The collected sidescan sonar data depict significant damage to the vessel associated with the apparent collapse of its deck (Figure 148).

A diver performed a reconnaissance of Shipwreck #2 prior to acoustical imaging of this shipwreck. The diver identified an iron hull and located a number of brackets that supported a

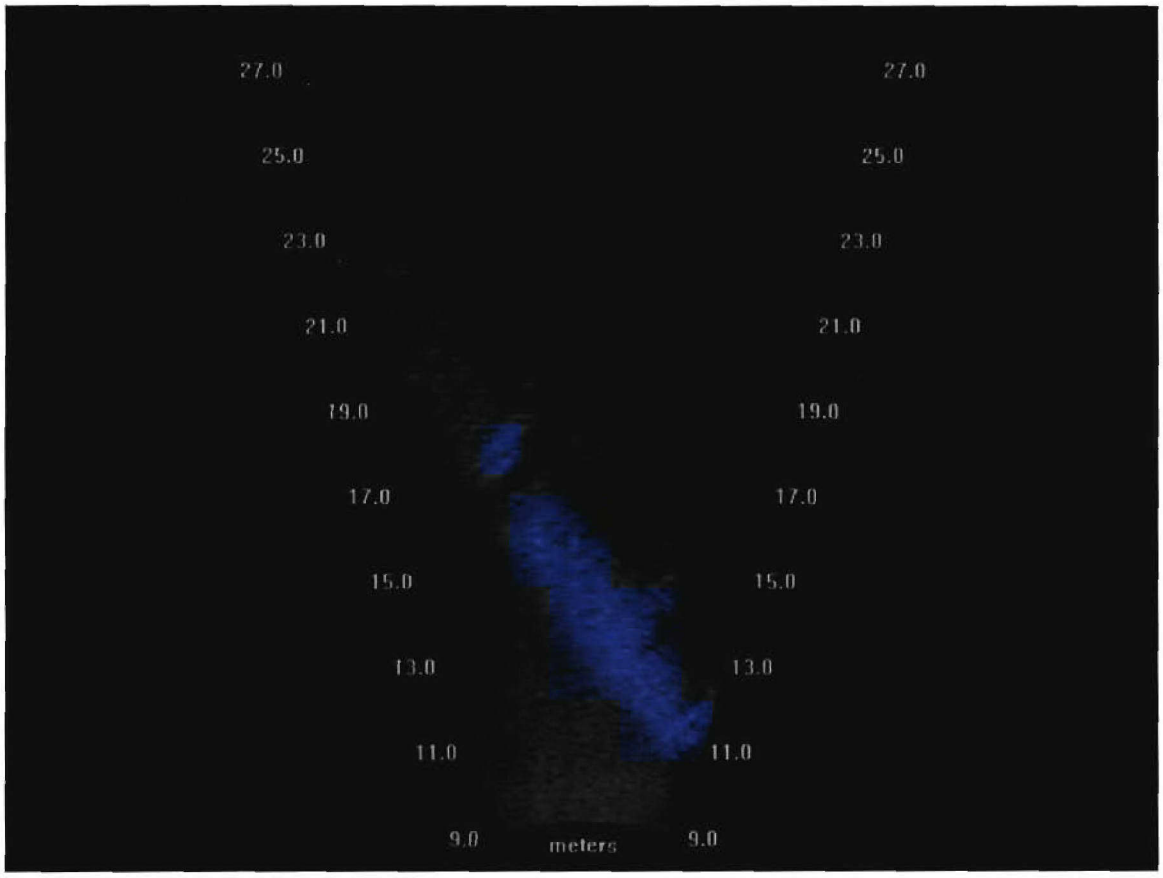


Figure 144. **Sonic camera image of fractures in the *Addison Bullard's* hull.**

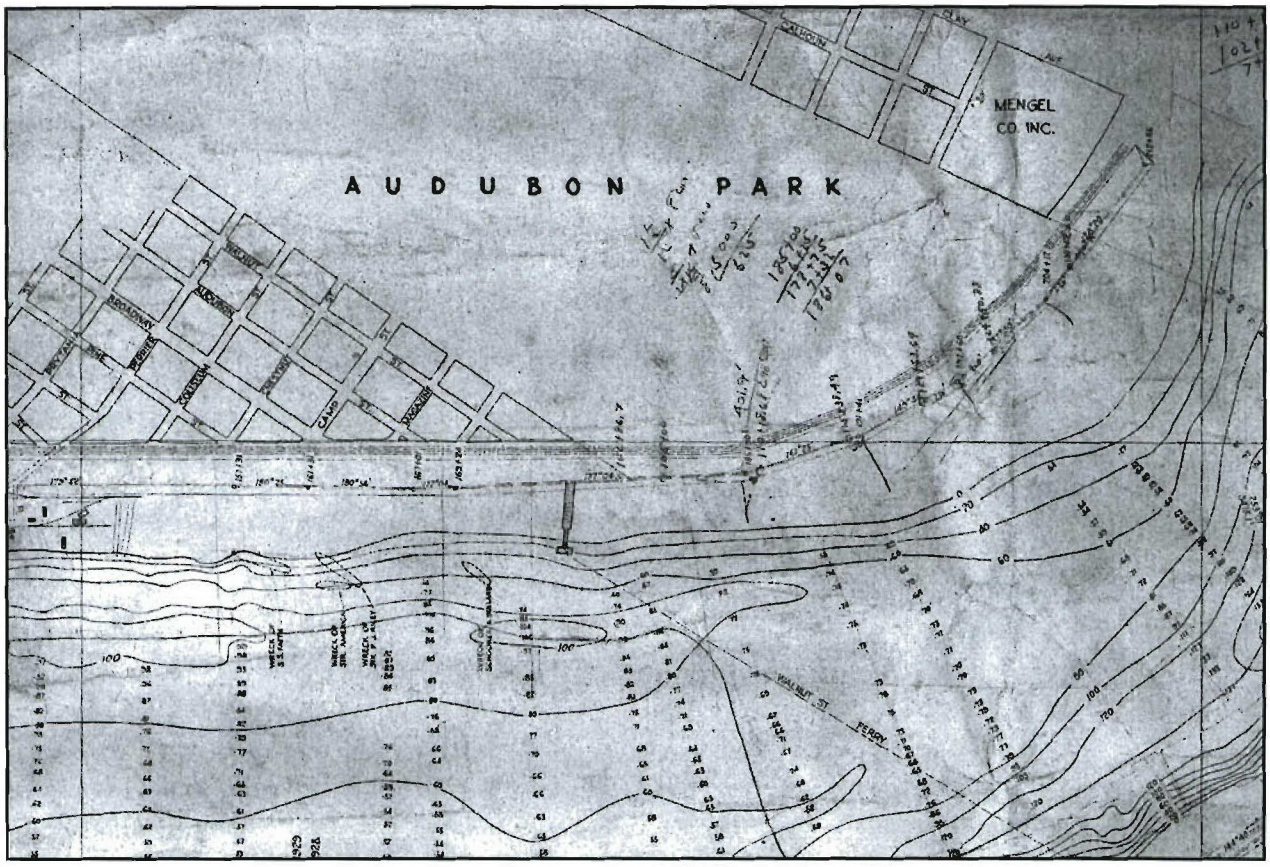


Figure 145. **Map of the** New Orleans Harbor, Dec. 1927 to Aug. 1928, depicting **the location of the remains of the *Addison E. Bullard*, *P. J. Riley*, *America*, and *S. S. Faith* (University of New Orleans, Special Collections Division, War Department 1928).**

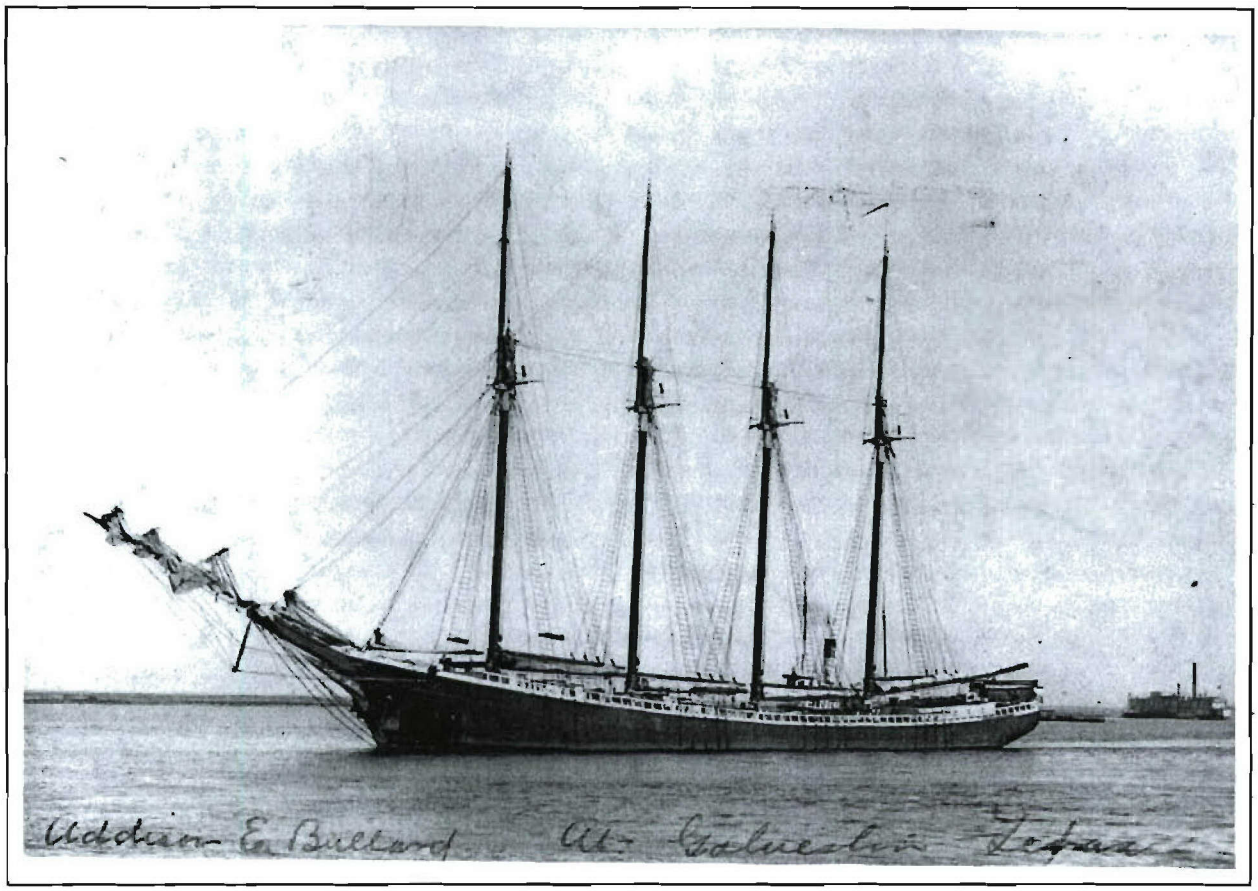


Figure 146. **A photograph made in Galveston, Texas shows that the *Addison E. Bullard* being assisted by a steam tug on her starboard stern (Photo courtesy Maine Maritime Museum, Bath, Maine).**



Figure 147. **Photograph showing the *Addison E. Bullard* is in the process of being un-rigged. Her topmasts have been struck and her foremast removed (Photo courtesy William A. Bisso, III, Bisso Historic Photograph Collection).**

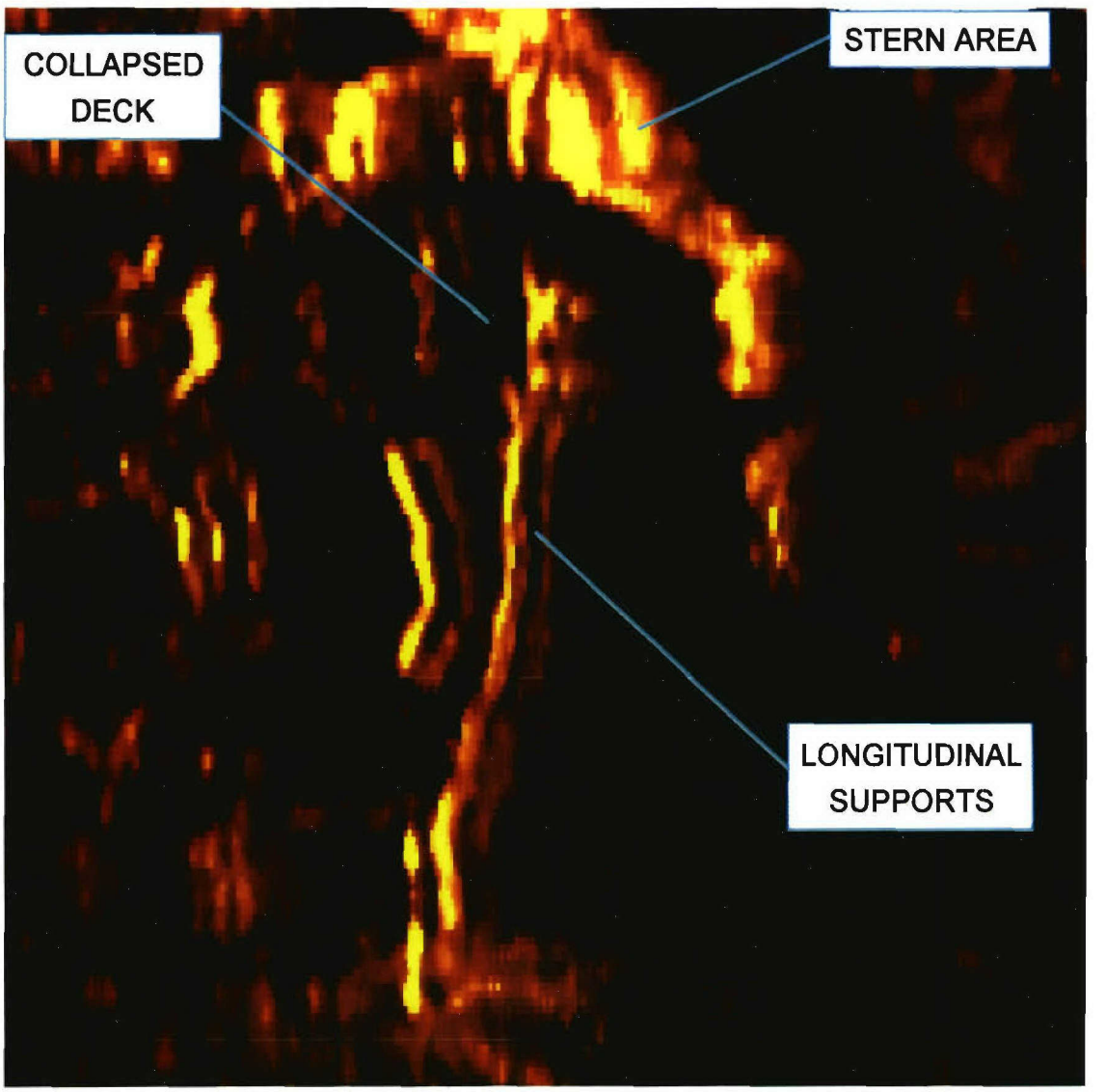


Figure 148. **Side Scan Sonar Image of Shipwreck #2 (*Chickasaw/Gouldsboro*), Showing Collapsed Deck and Damaged Stern.**

propeller shaft. Some decking was identified, but large sections were missing exposing iron deck beams spaced at approximately 0.6 m (2 ft) intervals. Portions of the wood planking, however, still overlay the iron deck plate. The sonic camera collected images of the shaft brackets, the curve of the stern, and the iron deck beams (Figure 149).

In addition, the diver reported that the deck had a cambered overhang, while in the bow area armoring or an additional overhang was present. Four large deck cleats, two forward and two aft, as well as two oval hatchways positioned to either side of the stern, were identified forward of the fantail. These hatchways measured approximately 30.5 x 45.7 cm (12 x 18 in) in size; they likely were used for ventilation. While the covers were missing, the two hinges and securing lock bolt were present. Finally, a total of four propeller shaft brackets with incorporated stuffing boxes were identified.

Based upon the wreck's location, William A. Bisso, III, has stated that Shipwreck #2 represents the hull of the *Gouldsboro*; this determination later was confirmed by the analysis of sidescan sonar data, diver reports, and comparison of ship's plans with the remote sensing data. The *Gouldsboro* was described as a railroad ferry that was converted from the Union Navy's *Chickasaw* after the Civil War. Originally, the *USS Chickasaw* measured 63 m (206 ft) in length and 16 m (52.4 ft) in width; it consisted of a twin turret, iron hulled monitor that was designed and built by James B. Eads for service in the Civil War. The results of the dives and camera work on this vessel indicate that while the *Chickasaw/Gouldsboro* underwent substantial rebuilding, including the removal of all turrets and deck structures and a later conversion to a side-wheel propulsion system, the hull, and especially the stern, was substantially unaltered. Once the ferry was removed from service, it was used as a flat barge by the Bisso family, at which time the *Gouldsboro* was cut down by approximately 14 m (46 ft); this was confirmed by the sidescan sonar data.

As mentioned above, James B. Eads, a self-taught engineer who spent much of his adult life on the Mississippi River, designed the *Chickasaw*. During the pre-Civil War period, Eads operated a number of vessels that were engaged in the salvage business on the Mississippi River. Before the war, Eads had written the Navy to suggest that a fleet of armored, steam powered, ironclad gunboats should be built to control the Mississippi and the navigable western river system. His plans received a cool reception; however, after the fall of Fort Sumter in early April 1861, he received a telegram that requested a visit to Washington, D.C. During this meeting, he discussed the western river situation with President Lincoln and presented his plans for the ironclad warships. By the end of August, Eads had a contract to build a fleet of these ships. He returned to St. Louis (Carondelet) where he started his men and numerous subcontractors working on the project around the clock. In a remarkable feat, Eads turned out the first ironclad 45 days after work on the project began, and the entire contract was accomplished in little less than 100 days out of shipyards at Carondelet and Mound City (Catton 1960:181). The development of the Mound City Naval Shipyard and of the so-called Eads or City Class Ironclads is described in detail in Goodwin and Jones (1986). The *Cairo, Carondelet, Cincinnati, Louisville, Mound City, Pittsburg,* and *St. Louis,* together known as the City Class Ironclads, were commissioned and in service on the western waters by January 1862 (Goodwin and Jones 1986). The ironclad idea was adopted by the Confederacy, and both sides pursued this new innovation throughout the war.

Following the introduction of the monitor class warship, Eads built a number of monitor type vessels for service on the Mississippi River. Eads' version drew less water than those built along John Ericsson's design on the East Coast, as they were intended primarily for use in shallow waters found in the navigable drainages of the western river system. Eads also designed a complex steam-driven turret used on his river monitors that rivaled Ericsson's.

The *USS Chickasaw* was a Milwaukee class, twin turret monitor based on Eads' Neosho class of single turret river monitors (Figures 150 and 151). The *Chickasaw* and other Milwaukee class monitors, *Milwaukee, Winnebago,* and *Kickapoo,* were driven by four screw propellers, rather than a stern wheel as used in the Neosho class; they all were destined for action in Mobile Bay, Alabama (Figure 152). In

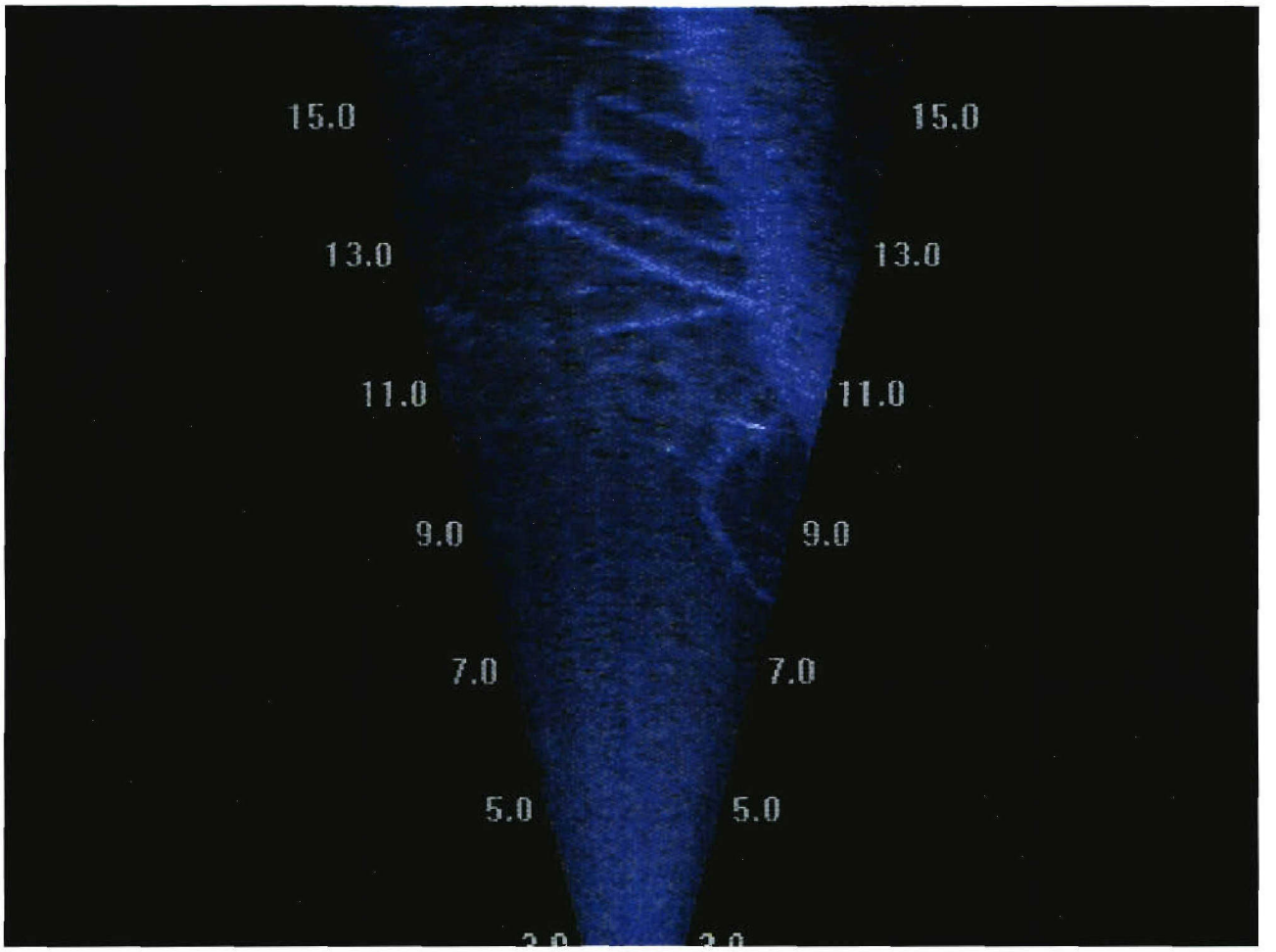


Figure 149. **Sonic camera image of iron deck beams of *Chickasaw/Gouldsboro*.**

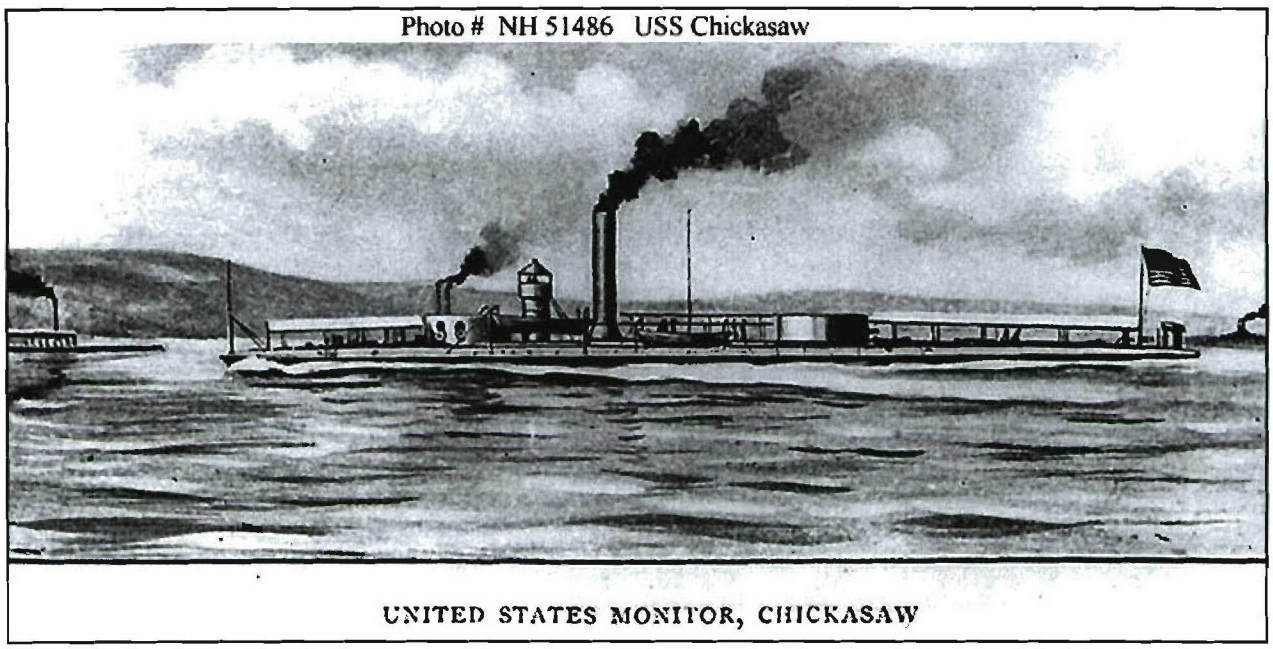


Figure 150. **The *U.S.S. Chickasaw* underway. Note the distinctive elevated pilothouse just behind the forward turret. An awning has been spread in front of the forward turret to afford shade from the sun for off duty crewmen who sought the cool of the deck (Anonymous n.d., Courtesy of the Naval Historical Center, Washington, D.C.).**

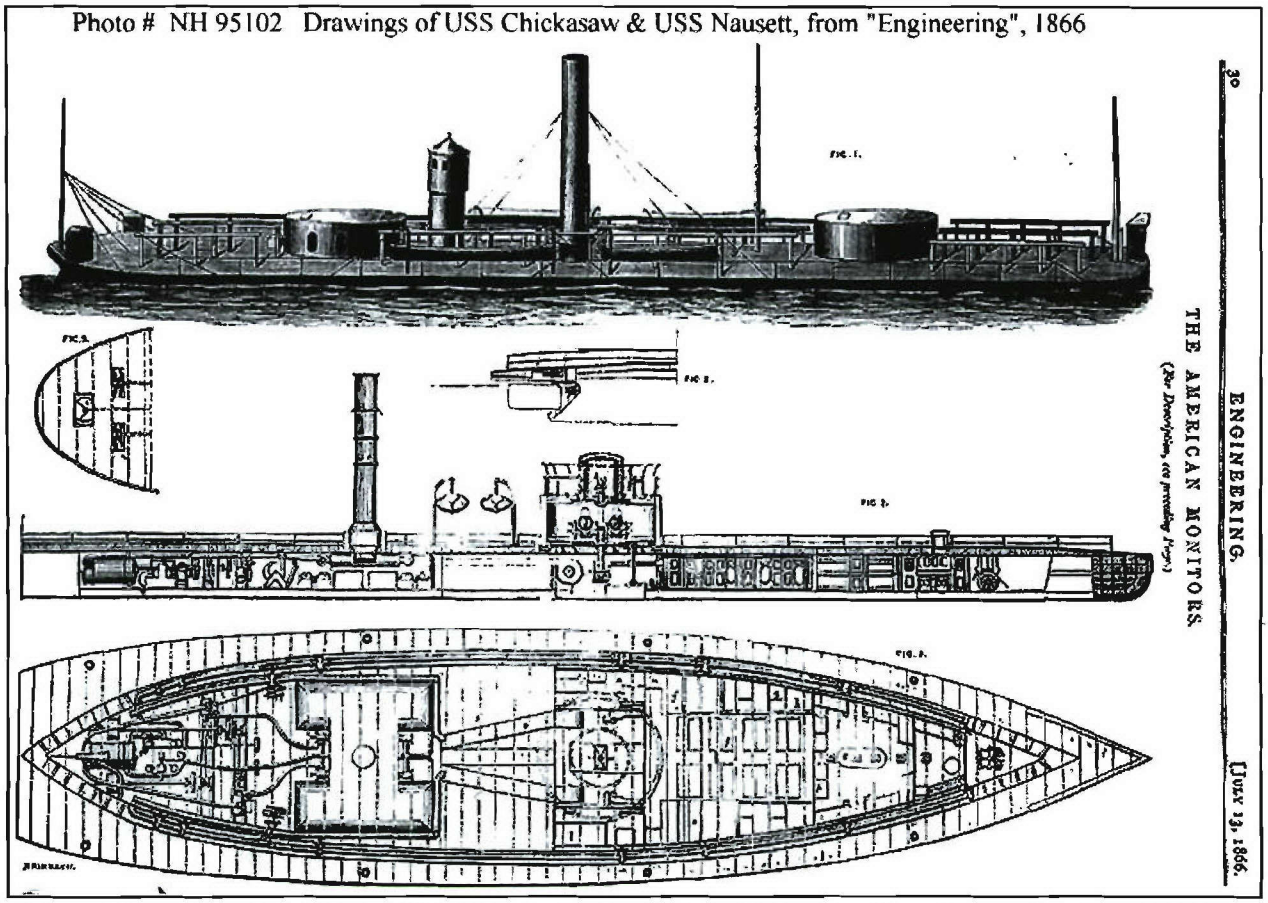


Figure 151. **Drawing of the *U.S.S. Chickasaw* showing deck detail. A series of stanchions and horizontal timbers are shown on deck forward, midships, and aft. These provided shade so that the men could spend all time possible on deck. This was necessary because the inside to the vessel was extremely hot and uncomfortable. These structures would have been struck down in preparation for combat operations to clear the field of fire for the guns (Anonymous 1866, Courtesy of the Naval Historical Center, Washington, D.C.).**

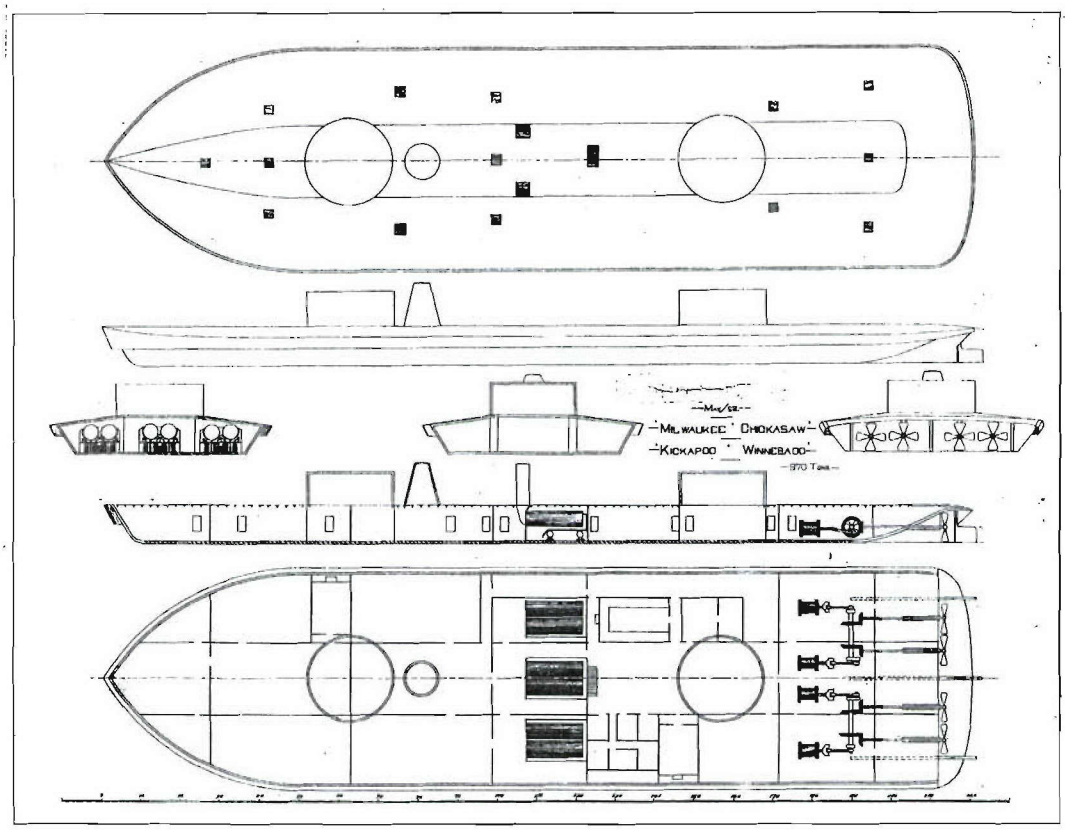


Figure 152. **Pre-build plans from the National Archives in Washington, D. C. of the Milwaukee class twin turret monitors. Note the very unusual arrangement of four screw propellers. It should also be observed that the pilothouse underwent design change during building making it taller and cylindrical (Drawing courtesy Duane Borchers, National Archives, Washington, D.C.).**

this regard at least, they were much more like Ericsson's monitors.

The *USS Chickasaw* was built at St. Louis, Missouri under contract with T. G. Gaylord at a cost of $389,597.55. The *Chickasaw* measured 69.8 m (229 ft) in length, with a beam of 17 m (56 ft); it had a draft of only 1.8 m (6 ft). At 970 tons, it was armed with four 11 inch (27.9.cm) Dahlgren smooth bore cannons, two per 20 cm (8 in) thick armored turret. It carried a compliment of 138 officers and crew. The *Chickasaw* was commissioned on May 14, 1864, and it was delivered to the U.S. Government at Cairo, Illinois that same month (U.S. Secretary of the Navy [*ORN*] 1999a). The *Chickasaw* was attached to the U.S. Mississippi Squadron at Mound City, Illinois (Goodwin and Jones 1986), under the command of Rear-Admiral Porter (Catton 1960:313). However, he was not destined to hold on to the *Chickasaw;* by late June, there were plans to have it transferred to the Western Gulf Blockading Squadron under the command of Rear-Admiral David G. Farragut for the upcoming operation against Mobile Bay.

The monitor *USS Winnebago*, another new Milwaukee class vessel, and the *Chickasaw* made the transit to New Orleans in July of 1864. From New Orleans, they moved down the river and out into the Mississippi Sound. There, the *Chickasaw* was detained by weather at Petit Bois Island Pass, while the *Winnebago* proceeded to the rendezvous inside of Sand Island at the entrance to Mobile Bay. On three occasions during the transit, the ropes of *Chickasaw's* steering gear stretched with the result that during maneuvering, the rudder would be pulled into the propellers. It is likely that problems with the steering gear had something to do with the ironclad's delay at Petit Bois Island Pass.

The *USS Chickasaw* was one of four monitors assigned to the operation in Mobile Bay. These were the two single turreted monitors *Tecumseh* and *Manhattan* from the East Coast that carried two 15-inch guns each, and the two, two-turreted monitors *Winnebago* and *Chickasaw*. The operation got underway early in the morning of August 5, 1864.

Because the monitors were slower than the rest of Farragut's fleet, they were the first ordered to move into Mobile Bay, making for Fort Morgan; they were supposed to screen and suppress the fire from Ft. Morgan to allow the rest of the fleet to pass. The fleet essentially acted in two units, with the four monitors comprising one group, and the 14 other steamships, including Farragut's flagship *USS Hartford,* as the second. The ships were paired and lashed together as part of the strategy used to run the guns at Vicksburg. It kept vessels from colliding with one another, but also permitted the advance to continue should one vessel's engine shut down due to shot damage to its boiler or other machinery.

The monitors were led by the *USS Tecumseh*, which was followed in order by the *Manhattan*, the *Winnebago*, and the *Chickasaw*. The monitors moved into position and commenced firing on Fort Morgan, which had opened fire on the fleet at 7:06 in the morning. The *Hartford,* second in line behind the *Brooklyn* in the main battle group, moved ahead when the latter slowed to clear what appeared to be a line of torpedoes or mines. Shortly thereafter, the ironclad *Tecumseh* struck a torpedo and went to the bottom, taking with it its captain and most of the crew. This gave all in the fleet pause. When warned of torpedoes ahead, however, Farragut spoke his famous reply - "Damn the torpedoes! Full speed ahead!" (Schlesinger 1983:291).

A number of Confederate vessels were on hand to oppose the entrance by Federal forces into Mobile Bay. These, led by the Confederate ram *CSS Tennessee* under the command of Admiral Buchanan, included the gunboats *Selma*, *Morgan*, and *Gaines*. Due to its slow speed, the *Tennessee* was unable to ram any of Farragut's attacking fleet. The gunboats, however, laid down a good field of fire raking the *Hartford* among others. Farragut detached the *Metacomet* in pursuit, which managed to capture the gunboat *Selma*. The *Gaines* and *Morgan* managed to obtain safe anchorage below the guns of Fort Morgan, though the *Gaines* was disabled and ran aground (*ORN* 1999b).

With the exception of the *USS Tecumseh*, all vessels successfully ran the torpedoes and guns of Fort Morgan. During the action, the *USS Chickasaw* sustained damage to the stack and starboard side near the aft turret. As the monitors caught up, the main body of the fleet began anchoring in the bay beyond. The *CSS Tennessee,* however, made a slow approach to the fleet. Far-

ragut signaled the fleet to attack the *Tennessee* with gunfire and by ramming it at speed. Several of the large Federal ships did this to little apparent effect.

The *USS Chickasaw*, ordered to close with the *CSS Tennessee*, had low steam due to the stack damage. The boiler crew added tallow and coal tar to the furnaces and made rapidly for the *Tennessee*. A number of fleet vessels were firing broadsides the *Tennessee;* in most instances, the cannonshot bounced off the sides causing little damage (Figure 153). Finally, the *Chickasaw* approached and engaged the *Tennessee*. In the words of the *Chickasaw's* commander George Perkins:

> ...about 9:10 we closed with the ram, firing rapidly at her with steel and solid iron shot, and at times within a few yards of her, and at no time over 50 yards distant, ram passing on our port side and receiving our fire as she passed. Shot away the enemy's flagstaff and smokestack and soon afterwards her steering gear, which forced the enemy to stop. We opened our shot into the stern of the enemy, nearly all of which took effect, when she hoisted the white flag at 10:40. The steamer *Ossipee*, some distance astern, rapidly approached, and owing to our boats being lashed alongside and everything stowed away, succeeded in boarding her first, and some twenty or thirty minutes afterwards hoisted the American ensign. Took the ram in tow and anchored her under the stern of the *Hartford* and then came to anchor near the flagship (*ORN* 1999b: 776-857, 786).

> ...in the engagement with the ram Tennessee, 52 solid shot were fired in a short time and with great accuracy, the distance being from 50 to 10 yards. Seventy-pound charges were used with solid shot. The only difficulty experienced was with the steering gear, which parted, but we were able to manage the vessel by her engines (*ORN* 1999b: 680).

The action lasted approximately one-and-a-half hours. The *Chickasaw* averaged some 13 shots per gun at an average of seven-minute intervals between firing. Commander Johnston, the acting captain of Buchanan's *CSS Tennessee* also made an informative report:

> Returning to the pilot house for the purpose of more closely observing the movements of the enemy, I soon received a report that you [Admiral Buchanan] had been wounded, when I went aft to see you, and while there found that the after port cover had been struck by a shot which instantly killed a man engaged in removing the pivot bolt... and wounded yourself and one of the gun's crew, the latter mortally. I then learned that the two quarter ports out of which the after gun was intended to be used, had also been so jammed by the fire of the enemy... and that the relieving tackles had been shot away and the tiller unshipped from the rudder head. The smoke pipe, having been completely riddled by shot, was knocked down close to the top of the shield by the concussion of vessels running into the ship. At the same time the monitors were using their XI and XV inch solid shot against the after end of the shield...The enemy was not long in perceiving that our steering gear had been entirely disabled, and his monitors and heaviest vessels at once took position on each quarter and astern, from whence they poured in their fire without intermission for a period of nearly half an hour, while we were unable to bring a single gun to bear, as it was impossible to change the position of the vessel, and the steam was rapidly going down as a natural consequence of the loss of the smoke pipe.
>
> Feeling it my duty to inform you of the condition of the vessel, I went to the berth deck for this purpose, and after making my report, I asked if you did not think we had better surrender, to which you replied: "Do the best you can, sir, and when all is done, surrender," or words to that effect. Upon my return to the gun deck I observed one of the heaviest vessels of the enemy in the act of running into us on the port quarter, while the shot were fairly raining upon the after end of the shield, which was now so thoroughly shattered that in a few moments it would have fallen and exposed the gun deck to a raking fire of shell and grape (*ORN* 1999b:580).

To a lesser extent, the remaining two monitors, *Winnebago* and *Manhattan,* also participated in the battle against the *Tennessee*. The single turreted *Manhattan* used its two 15-inch guns on a number of occasions, but the *Winnebago* was greatly hampered due to the failure of one or both of its turrets as it passed Fort Morgan. It could only bring guns to bear by maneuvering, and so for the most part kept clear of the *Tennessee* while the larger vessels of the fleet

Photo # NH 83136 Chart of the Battle of Mobile Bay, 5 August 1864

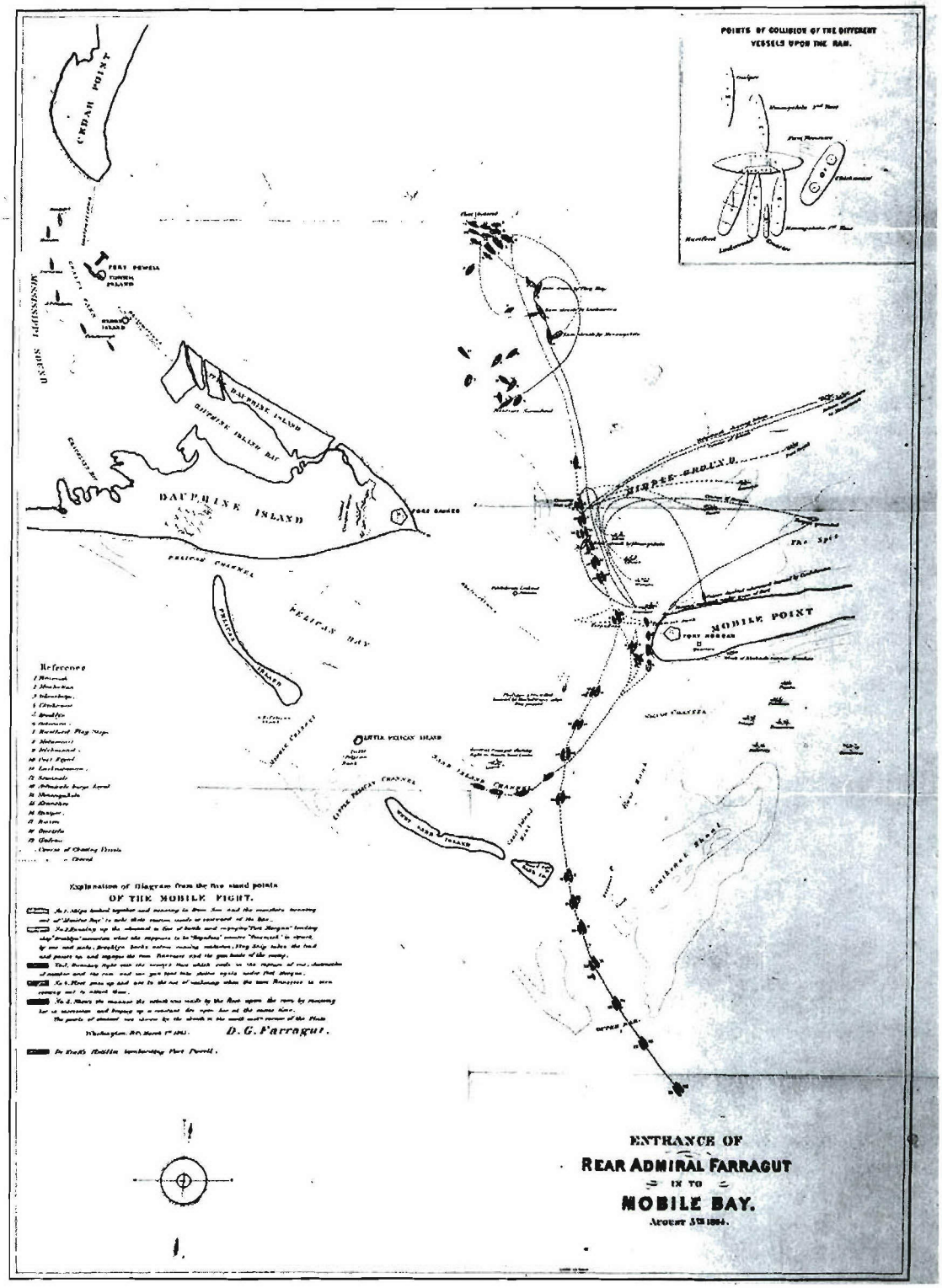


Figure 153. **Map showing the movement of vessels during the Battle of Mobile Bay on August 5th, 1864 (Farragut 1865, Courtesy of the Naval Historical Center, Washington, D.C.).**

rammed and delivered broadsides. The *Chickasaw* clung to the stern, reducing the *Tennessee*'s after end shield (Figures 154 and 155).

The *Chickasaw's* actions in the Battle of Mobile Bay were some of the most prominent, and the Battle of Mobile Bay is one of the principal naval engagements of the Civil War. One of the indications of this is the number of drawings and paintings of the fight with the *Tennessee*. The *Chickasaw* soon after this engagement was busy again, this time against one of the three principal forts that guarded the entrance to Mobile Bay.

The *Chickasaw* had a short but distinguished military career. It saw action against numerous forts in Mobile Bay and also participated in the 100 gun salute on April 6, 1865, which commemorated the fall of Selma and the defeat of General John E. Johnston in North Carolina. The *Chickasaw,* along with the *Cincinnati* and *Nyanza,* also took the surrender of vessels under the command of Commodore Ebenezer Farrand, of the C.S. Navy on May 10, 1865. This effectively concluded the naval war in Mobile Bay. Inevitably, on July 2, 1865, the *Chickasaw* was ordered ready for sea and it departed for New Orleans under tow of the *USS Sebago.*

Of the four Milwaukee class twin turret monitors built, three survived the war: the *Chickasaw*, *Winnebago*, and *Kickapoo*. The *Milwaukee* struck a torpedo in the Blakely River, Mobile Bay, in March 1865. It was raised in 1868 and towed to St. Louis. It is said that some of the iron of this vessel was used to construct the Eads Bridge in that city.

All three monitors were transferred to New Orleans at the end of hostilities, and laid up at Algiers; there they remained for nine years before being auctioned off on September 12, 1874 (Figure 156). The *Winnebago* and *Kickapoo* were sold to breakers, while Mr. D. Campbell of the New Orleans Pacific (NOP) Railroad acquired the Chickasaw. It was purchased at auction for the price of $8,350.00, a fraction of the original cost of $389,597.55 (*ORN* 1999a). The *Chickasaw* was re-named the *Samson* and its superstructure was removed to convert it into a coal barge. It was noted as making one trip to St. Louis in 1878, while being towed by the *Simpson Herner* (Reuben M. Feuge, personal communication: October 14, 2003).

In 1880, the *Samson* was converted to a rail ferry by the New Orleans Pacific (NOP) Railway and re-named the *Gouldsboro*. The name was in honor of Anna Gould, who was the chief stockholder of the Texas & Pacific (T&P) Railway and who later purchased the NOP Railway. This sale was apparently planned at the time the vessel was named; otherwise the ferry would not be named in honor of a stockholder of a competing railroad (Reuben M. Feuge, personal communication: October 14, 2003).

The superstructure of the *Gouldsboro* was rebuilt in 1881, the hull was rebuilt in 1910, and new boilers were installed in 1929. On November 20, 1936, Federal inspectors reviewing the vessel determined that the boilers would need extensive repairs, and ordered a suspension of the vessel until repairs were made. The extensive repairs were considered cost prohibitive, and the vessel was taken out of service. In 1938, work was started again on the superstructure; however, the vessel was officially retired in 1941. NOP Railway was using the vessel *L. S. Thorne* for rail transport in place of the *Gouldboro,* and the company was deciding whether to build a new vessel or to use the Huey P. Long Bridge. The *Gouldboro* also was used in the RKO movie "Murder at the Crossing" (Reuben M. Feuge, personal communication: October 14, 2003).

The *Gouldsboro* was enrolled in the port of New York on January 11, 1883, where it was issued Certification No. 115. This enrollment certified the vessel as a side-wheel steamboat with a single deck, no masts, a plain head, and square stern. Its length was given as 62.7 m (206 ft), with a beam of 16 m (52.4 ft), and a depth of 2.7 m (9 ft); it weighed 469 gross tons. The *Gouldsboro* later was enrolled in the port of New Orleans on May 14, 1908, at which time it was issued Certificate No. 51, official No. 33972 (Enrollment Book No. 12, October 1, 1907 to June 30, 1911:39). A. P. Boardman of New Orleans took oath swearing that the Texas & Pacific Railway Company, domiciled in the city of New York, was the sole owner of the vessel.

The *Gouldsboro* was re-enrolled in July 9, 1914; the enrollment of 1908 was surrendered

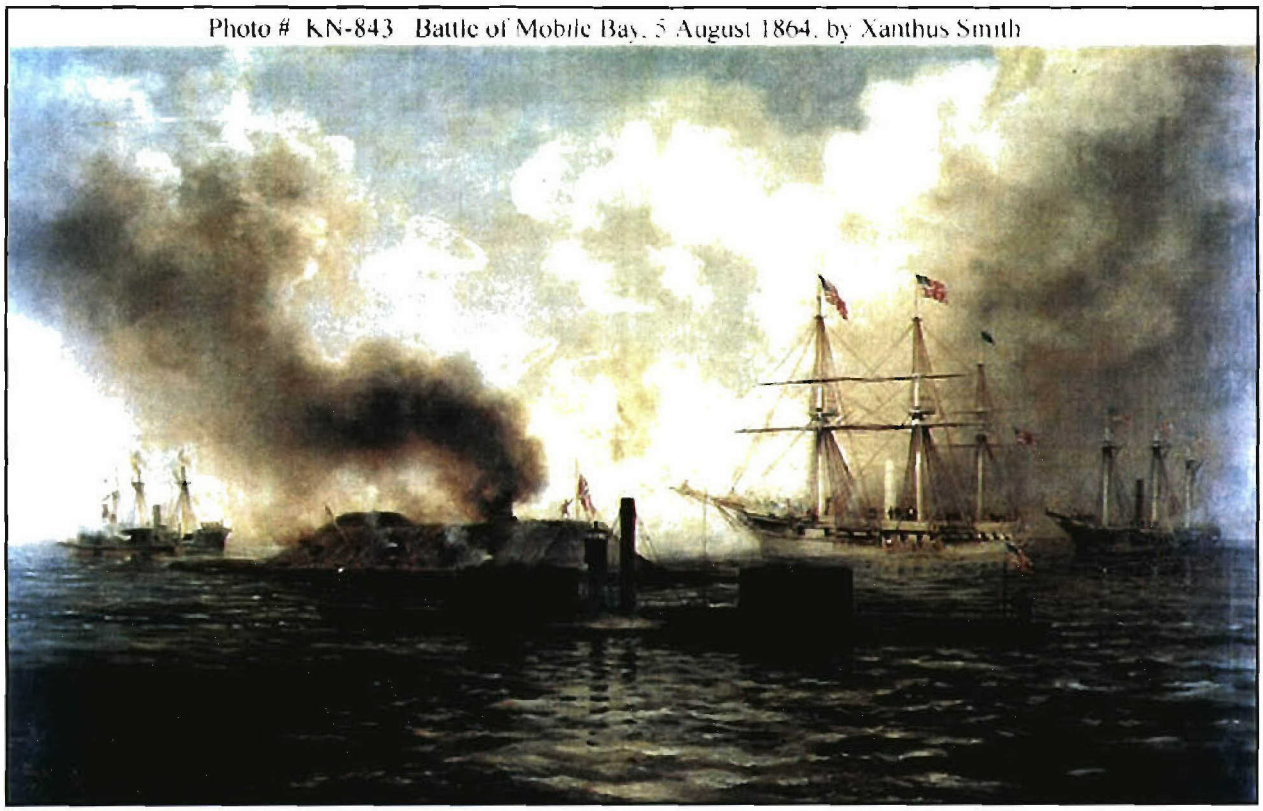


Figure 154. **Oil Painting of the Battle of Mobile Bay showing the *Chickasaw* in firing off the stern of the *C. S. S. Tennessee* before her surrender. This painting of the battle shows the *Chickasaw* as she actually appears. A number of paintings of the battle show the *Chickasaw* as an east coast Onadaga class twin turret monitor (Smith 1890, Courtesy of the Naval Historical Center, Washington, D.C.).**

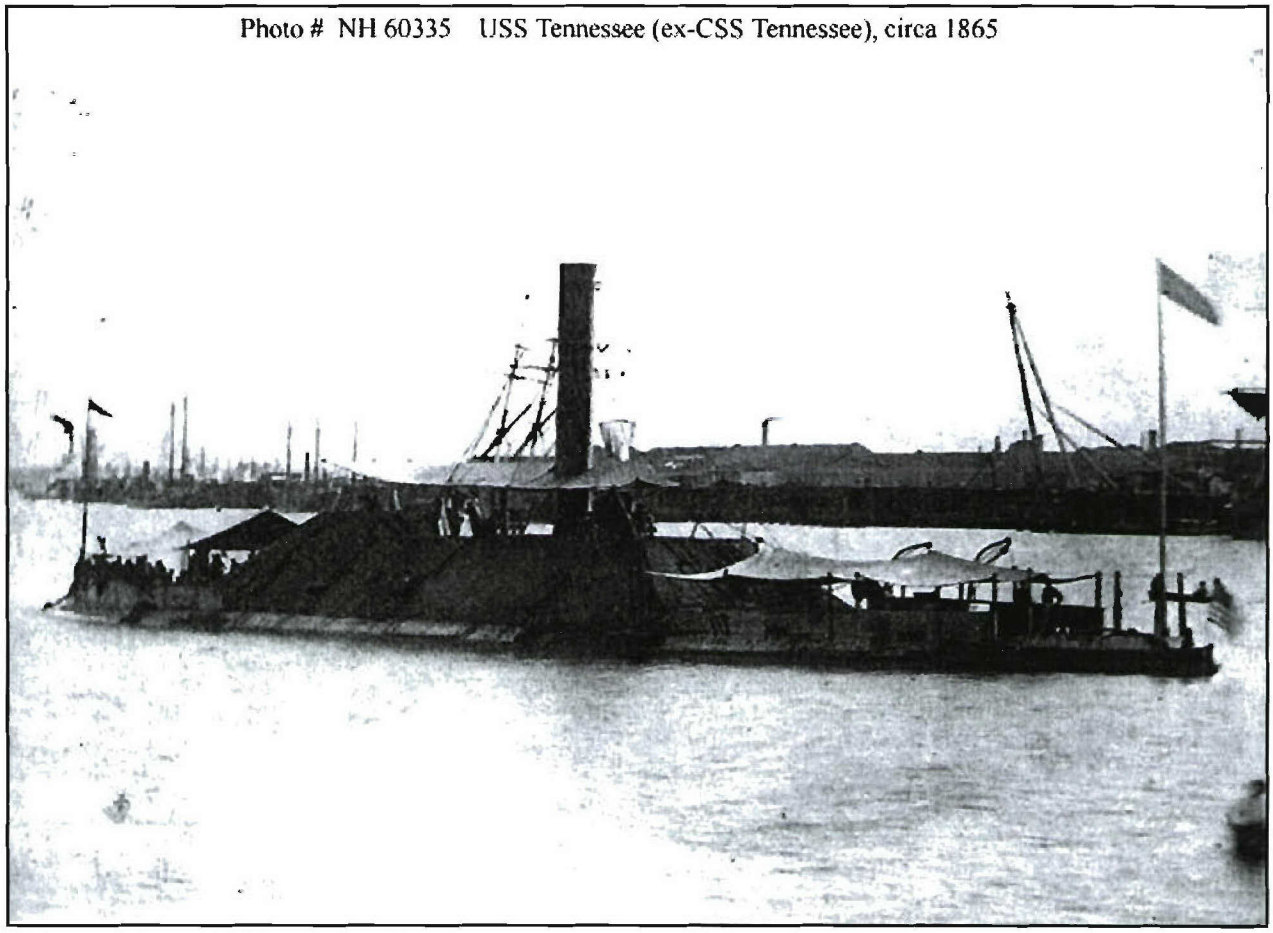


Figure 155. **The *Tennessee* on the Mississippi River in New Orleans after her capture and incorporation into the Union Navy (Anonymous n.d. [ca. 1865], Courtesy of the Naval Historical Center, Washington, D.C.).**

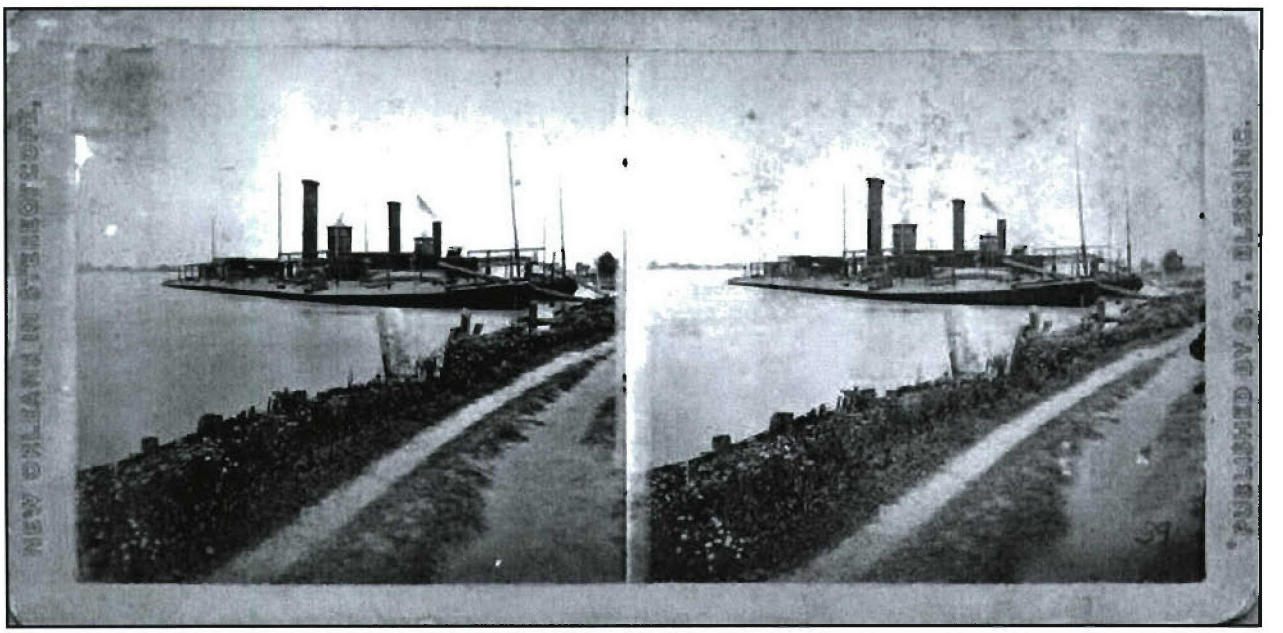


Figure 156. **Perhaps the only photograph of all three surviving Milwaukee class monitors shows them tied up on the bank line in Algiers. Note the gangplanks used for boarding the craft. The third monitor in the distance is difficult to make out due to the presence of an object on top of the forward turret of the second monitor obstructing a clear view of the third monitor's pilothouse (Blessing n.d. [ca. 1865], Courtesy of the Louisiana Division, Orleans Parish Library, New Orleans, Louisiana).**

and a new document issued (Enrollment Book No. 14, July 1, 1914 to June 30, 1915:1). The tonnage figures and vessel dimensions are the same as in the earlier enrollment, and the *Gouldsboro* still was described as "of New York." The vessel's official number remained unchanged, and it received Certificate No. 1. The enrollment and license forms had been combined since 1908; therefore, the *Gouldsboro*'s license is included in Certificate No. 1. Still under master A. P. Boardman, it was licensed in the coasting trade for one year to the day.

Opposite the Consolidated Certificate of Enrollment and Licenses can be found an Oath of Master to Loss of Document. A.P. Boardman declares the loss of *Gouldsboro*'s document in the September 29, 1915 hurricane. The new document was signed by Boardman and dated October 13, 1915. On the back of this new Consolidated Certificate of Enrollment and License Certificate No. 1, are eleven sections for endorsements of Renewal, which renewed its coasting trade license from 1915 to 1925. Upon expiration of renewal No. 11, a new marine paper had to be issued.

Information in the Record of Marine Documents Deposited recorded two entries for the *Gouldsboro* (Record of Marine Documents Deposited January 1915 to July 1932). The first entry (discussed above) was Index No. 112, and it was a record of the deposition of the Consolidated Certificate of Enrollment and License, Certificate No. 1 issued in July 1914. The second entry shows that a new marine document, Certificate No. 11, was created on June 30, 1926, with annual renewals up to 1929. For an unspecified reason, a fine was imposed on the vessel on January 19, 1931; it was paid by the master of the *Gouldsboro* (Record of Marine Documents Deposited January 1915 to July 1932:37).

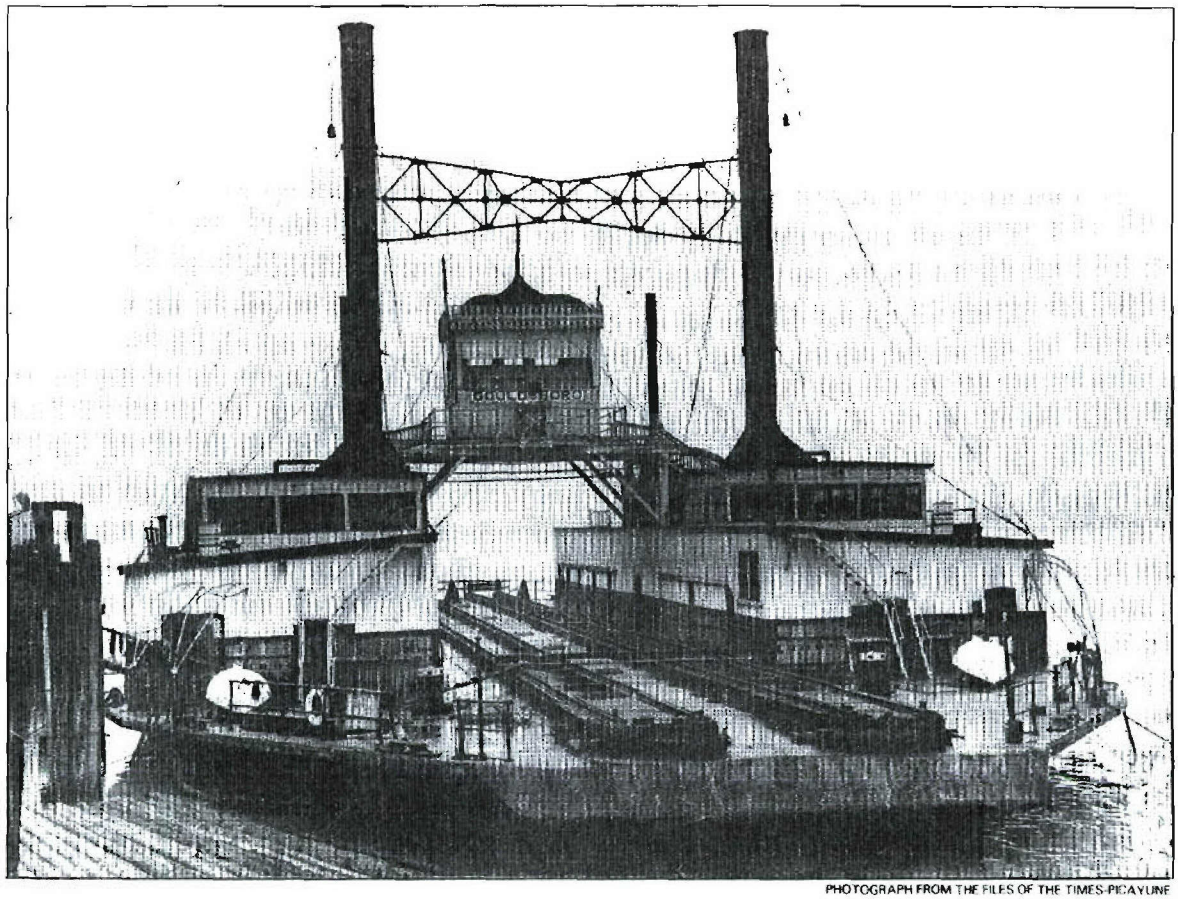
Another set of books called the Record of Endorsements of Change of Master indicated that the *Gouldsboro's* master changed on a number of occasions. The record states F. A. Carlton came on board in January 1935, replacing M.J. Gibbons. Carlton was replaced by William Carlton in October 1937 (Record of Endorsements of Change of Master 1933-1941:10, 33). This latest change is interesting, considering its boilers had been condemned on November 20, 1936, and that it was placed out of service. It seems that while it was tied up there was still some hope of replacing the machinery; however, the vessel was retired officially in 1941 (Figure 157).

There apparently were some negotiations with the Mexican Government to sell the vessel for conversion to a dredge; however, the discussions did not conclude with a sale. Some time in the 1940s, the *Gouldsboro* was purchased by the New Orleans Coal & Bisso Towboat Company. During its time with the company, the vessel kept the name *Gouldsboro* and served as a typical deck barge. It was used on at least one occasion for transporting a small tugboat for repowering. At that time, it was equipped with a deckhouse at the stern of the barge, possibly to shelter men and equipment (Figure 158).

Thus, Site 16OR190 (Shipwreck #2) was built as an ironclad warship in 1863-1864 and later served as a railcar ferry and deck barge well into the 1950s before sinking in the Mississippi River (William A. Bisso, III, personal communication: October 13, 2003). A review of the historic context and analysis of the available material indicates that the period of significance for Shipwreck #2 would encompass the years 1863 to 1874. At that time, the vessel was known as the *USS Chickasaw,* and it was involved in the Battle of Mobile Bay during the Civil War; in 1880, it was modified for use as a railcar ferry.

Criterion A of the National Register of Historic Places applies to *USS Chickasaw* as it relates to the thematic changes in marine technology and the technological revolution of warships during the American Civil War. The *Chickasaw,* and the other vessels of the Milwaukee class, the twin turret monitors, represent the height of the evolution of the monitor ironclads during this period. These vessels were an important developmental step that led directly away from the combination of sail power and wooden hulls to complete dependence on steam power and iron hulls. This eventually led to the development of the dreadnoughts, cruisers, and battleships. In addition, the *Chickasaw* played a central role in the Battle of Mobile Bay, a major historical event where this vessel compelled the surrender of the *CSS Tennessee* and numerous forts fronting on the bay.

PICTURE FROM THE PAST



PHOTOGRAPH FROM THE FILES OF THE TIMES-PICAYUNE

1938: Last of rail ferries saw action during the Civil War

Before the Huey P. Long Bridge was built, trains were carried across the Mississippi River by ferry. The Gouldsboro was one of two floating train transports that the Mississippi Pacific-Texas Pacific Terminal Co. operated at New Orleans when this photograph was taken in 1938.

The vessel, completed at St. Louis in 1864, was originally the U.S. monitor Chickasaw, which saw service in the Battle of Mobile Bay during the Civil War.

It was laid up at Algiers in 1865, according to local railroad buff Reuben Feuge. Purchased at auction by "D. Campbell," it later saw service as a coal barge under the name Samson.

It was converted into a railroad ferryboat by the New Orleans Pacific Railroad Co. and renamed the Gouldsboro in 1880. MP-TP took over that line the following year.

The Gouldsboro and her sister ship the S.S. Thorne, the last of the rail ferries, were retired in the 1940s when the MP-TP began using the new Mississippi River bridge. The vessels were kept in reserve during the war. The Thorne was later dismantled, but the fate of the Gouldsboro is unknown, according to Feuge.

— **John Burke**

Figure 157. Photograph of the railway ferry *Gouldsboro* tied up at the end of her career. The photograph clearly shows the two sets of tracks that allowed her to carry a number of rail cars at a time (Burke 1990).

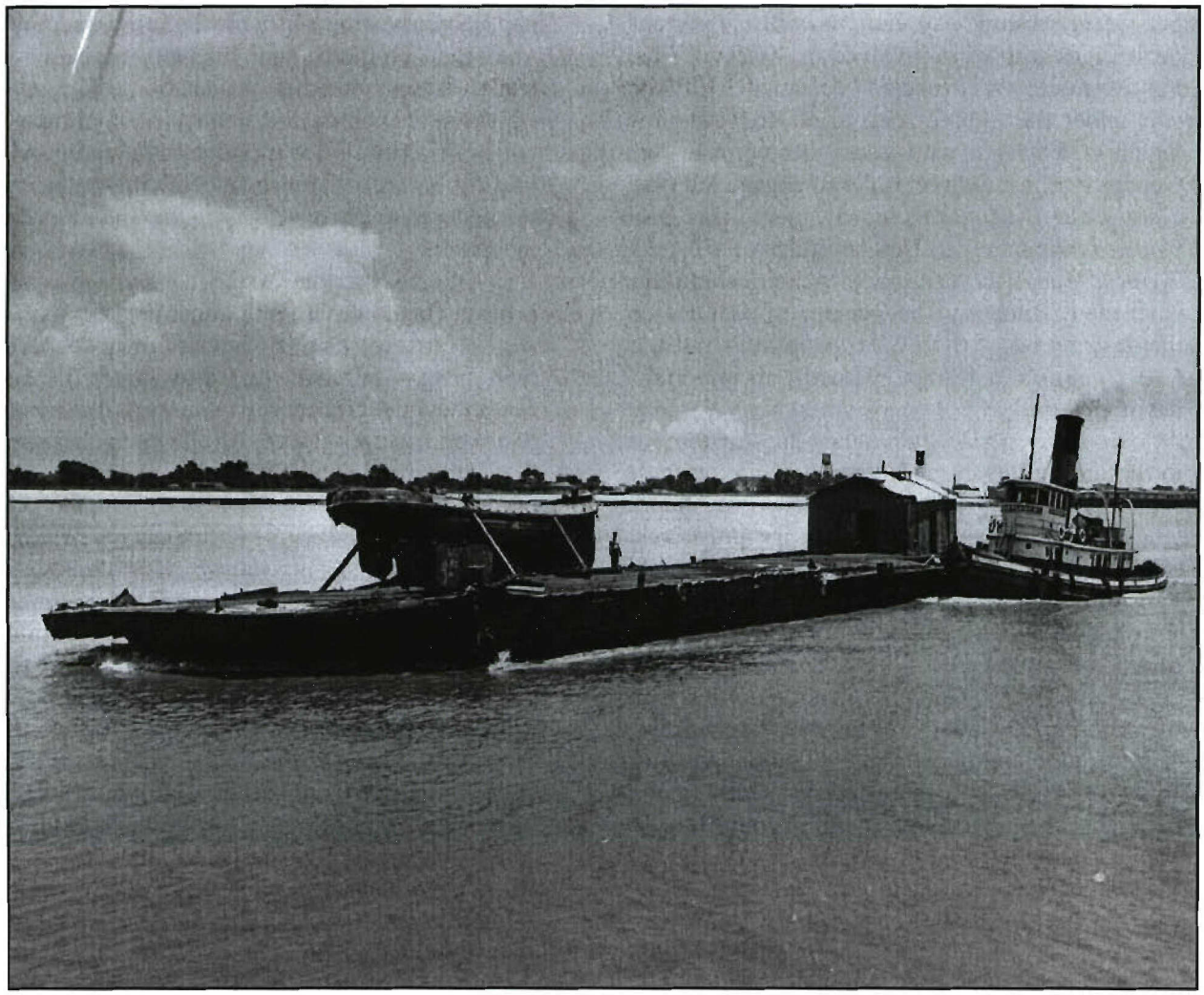


Figure 158. **Photograph of the deck barge *Gouldsboro* with former superstructure and rails removed. She is shown transporting a small tugboat to be re-powered (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

In addition, the *USS Chickasaw* has a number of interesting associations with important personages who were involved in the Civil War. For example, this ironclad, designed by Eads, was under the indirect charge of Rear-Admiral David G. Farragut who issued her commander, George Perkins, a direct order to engage the *CSS Tennessee*. During this engagement, the *USS Chickasaw* compelled the surrender of the *CSS Tennessee* and the capture of Admiral Franklin Buchanan. Buchanan had been responsible for the destruction of the *USS Cumberland* and the *USS Congress* at Hampton Roads, an important naval victory.

However, these individuals are a side-note to the more relevant and direct association with James Buchanan Eads, one of the most important men in the history of the Mississippi River. Numerous studies have been done on James Eads and his works, including the Mound City shipyard and marine ways in Pulaski County, Illinois, where three of Eads' City Class gunboats, the *Cairo*, *Cincinnati*, and *Mound City* were built. The latter area was researched and examined archeologically in 1986 (Goodwin and Jones 1986). Also, a more recent and extensive treatment of Eads may be found in John Barry's *Rising Tide*, published in 1997 (Barry 1997).

James Eads paved the trail of marine salvage in the Mississippi River. His wartime service was invaluable. He formulated an ultimately victorious gunboat strategy for the Mississippi River and her tributaries. He designed and built the steam powered ironclad gunboat and monitor flotillas recommended in that strategy. These, in turn, facilitated the control of the Mississippi River and her ports as well as those of the Gulf Coast, thus contributing in great measure to the successful Union prosecution of the War.

After the war, Eads designed and built the St. Louis Bridge. This was the most complicated and ambitious bridge construction project of its kind in the world, pioneering the use of steel in large construction (Barry 1997:58). He later designed and built, against great opposition and criticism, the Eads jetties at South Pass to produce a 9 m (30 ft) deep channel where no depth greater than 2.7 m (9 ft) had ever been recorded before. This was the first successful attempt to manipulate the current and cut a channel through the great sandbar at the mouth of the river that had been a vexing obstacle since the beginning of ocean commerce with the city of New Orleans. Based on this association, The USS Chickasaw exhibits the quality of significance under Criterion B for its direct association with Eads, a figure of transcendental importance in the history of the river, the region, and indeed of the nation.

Under Criterion C, the *Chickasaw* is significant for its design and construction. That is, the *Chickasaw* was one of four Milwaukee class, twin turret monitors designed by James B. Eads, a self taught engineer who is purported to be one of the top five engineers of all time. Therefore, the *Chickasaw* may be considered the work of a master. It was an unusual vessel and the only one of its class to survive both the Civil War and the ship breakers. The *Chickasaw* had many distinctive construction characteristics including the Eads' designed turrets, an elevated pilothouse, and the arrangement of four screw propellers and associated equipment.

Finally, as an archeological site, the significance of the *Chickasaw* was evaluated applying Criterion D, for its potential to provide valuable information concerning construction, use, or activity (National Register Bulletin 2000:21-24). Although a good deal of the *Chickasaw*'s original structure has been removed and undergone change, some of her features still are intact in the remains of the deck barge *Gouldsboro*. One of the most unique and distinguishing characteristics of this vessel was the propulsion, which utilized four screw propellers. The brackets and stuffing boxes for the four propeller shafts still are extent, as confirmed by diver and sonic camera investigations performed on September 18, 2003. The Milwaukee class, twin turret monitors were the only vessels in the Union and Confederate Navies to utilize four screw propellers. In fact, it is possible the Milwaukee class were the first vessels in the world to utilize as many as four screw propellers, making this surviving feature of the *Chickasaw* of considerable interest and importance.

Thus, Site 16OR190 (Shipwreck #2) appears to possess the qualities of significance under each and all of the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). As noted above, the vessel is no longer

complete, due to a history of demolition and refits and its integrity is somewhat questionable. Still, the available data indicate that at least a portion of the hull is intact: Furthermore, these remains comprise the very last of any of the Milwaukee Class Eads vessels. In this light, and because of its multi-faceted significance (Criteria A, B, C, and D), it is recommended that the *Chickasaw/Gouldsboro* be viewed as eligible for listing in the National Register of Historic Places. Consultation procedures for application of the criteria of effect and of adverse effect are outlined below.

Site 16OR191 (Shipwreck #3; *Boaz*)

Shipwreck #3 is situated adjacent to the hull of the *Addison E. Bullard* (or Shipwreck #1), at a river depth that ranges from 20.4 to 31 m (67 to 102 ft) (Figures 139 and 140). The vessel is positioned at UTM coordinates N3314061, E776469, at approximate River Mile 102.34 on the left descending bank of the Mississippi River. As a result of poor geometry between the sidescan sonar tow fish and the river bottom, the sidescan sonar did not confirm the precise location this wreck; however, it was recorded in the multi-beam data (Figure 159). The scaled length of this vessel measured approximately 30.5 m (100 ft), with a beam of 15.3 m (50 ft) (Table 16). Oral history and eyewitness accounts place the derrick barge *Boaz* in this location (William A. Bisso, III, personal communication October 13, 2003). In addition, similarity in available vessel dimensions indicates that Shipwreck #3 is the *Boaz*.

Construction and/or launching dates for the *Boaz* could not be determined; the earliest mention of the vessel is its listing in the index of the Record of Endorsements of Change of Master 1933-1941. This document indicates that she was enrolled in New Orleans on July 14, 1938, where she was issued Certificate No. 6. The *Boaz* was listed as a derrick barge, and its master at that time was Charles G. Leverette (Record of Endorsements of Change of Master 1933-1941:110). An enrollment document was not found in the Record of Enrollments from July 2, 1937 to March 29, 1941.

The vessel apparently came into the possession of the New Orleans Coal & Bisso Towboat Company no later than 1950 (Corps of Engineers 1950). The *Boaz* measured 29.3 m (96 ft) in length and 14 m (46 ft) in width, with a draft of 2.4 m (8 ft) fully loaded (Corps of Engineers 1963:233). Figure 160 depicts the *Boaz* engaged in loading scrap iron from a railway pier. A small boat is tied off to the starboard stern, and a ladder forward may have been used to board from the boat. A narrow smokestack and elevated enclosure above the deckhouse indicates that the *Boaz* was a steam-powered derrick.

Figure 161 depicts the *Boaz* engaged in assisting a pile driver to sink a row of pilings for wharf construction. The pile driver, in the foreground, repeatedly would raise and drop a driver onto the pile to sink it. The pile driver apparently was steam driven, as indicated by the boiler and smokestack that protrude through the deckhouse. A total of two deck barges stand by with stacks of long pilings, which are prevented from rolling by the temporary installation of wooden cribbing. Off the starboard side of the *Boaz* is a small derrick barge that also was pictured in association with the *Addison E. Bullard* (Figure 147).

Another photograph, presumed to post date 1963 because of the change in the company name and the different paint scheme on the vessel, depicts the *Boaz* wrecking out a large wooden structure, possibly another vessel (Figure 162). On the port side deck is a small boat, indicating that is was common practice to have a small skiff or other small craft on board for the derrick's needs. Moored to the side of the *Boaz* is Deck Barge No. 805, which has a curved bow. This is most likely the site where the *Boaz* dropped the wrecked out material for later transport and disposal.

This *Boaz* is of historic interest because it was one of four derrick barges involved in the 1964 salvage of the City class Union gunboat *Cairo*. This was one of the earliest underwater archaeology/interpretation/salvage efforts carried out in the United States.

The *Boaz* was sunk during a collision with the French flagged tanker *Sitala* on July 28, 1977. The *Boaz* was one of four vessels lost in that accident, and it was declared a total loss (National Transportation Safety Board 1978:10)

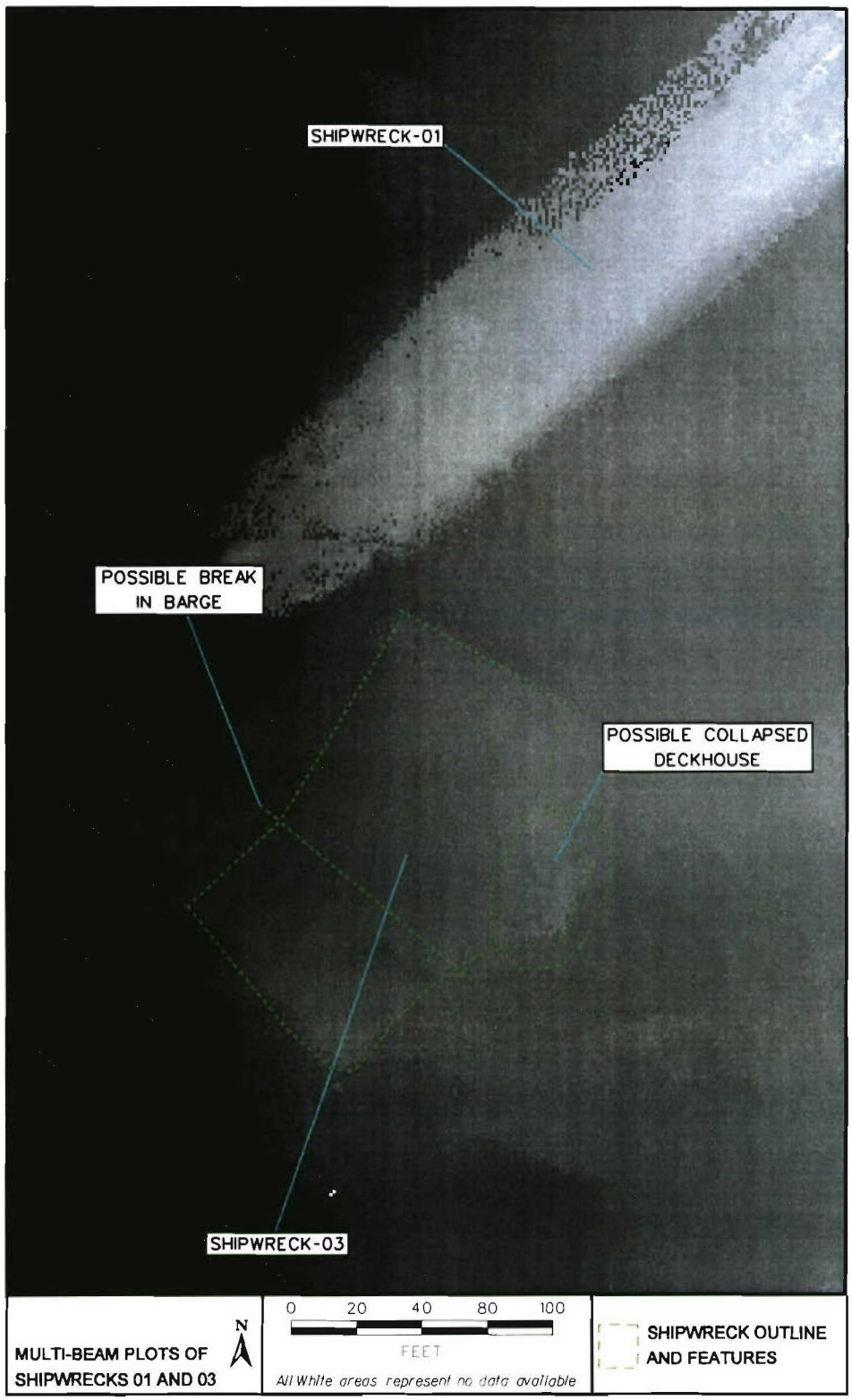


Figure 159. Multi-Beam Grid Plot of Shipwreck #3 (Derrick Barge *Boaz*).

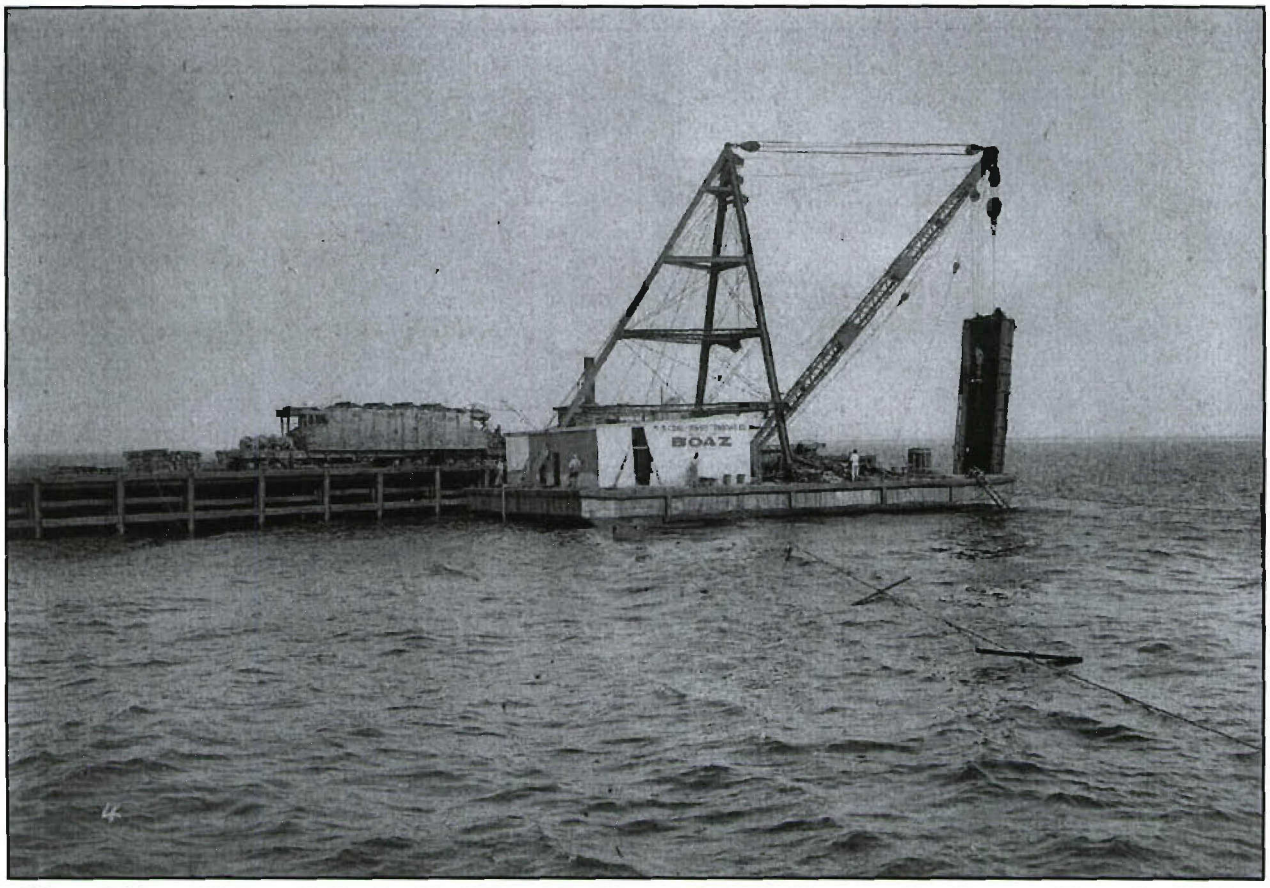


Figure 160. **Photograph showing the *Boaz* apparently engaged in loading scrap iron from a railway pier (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

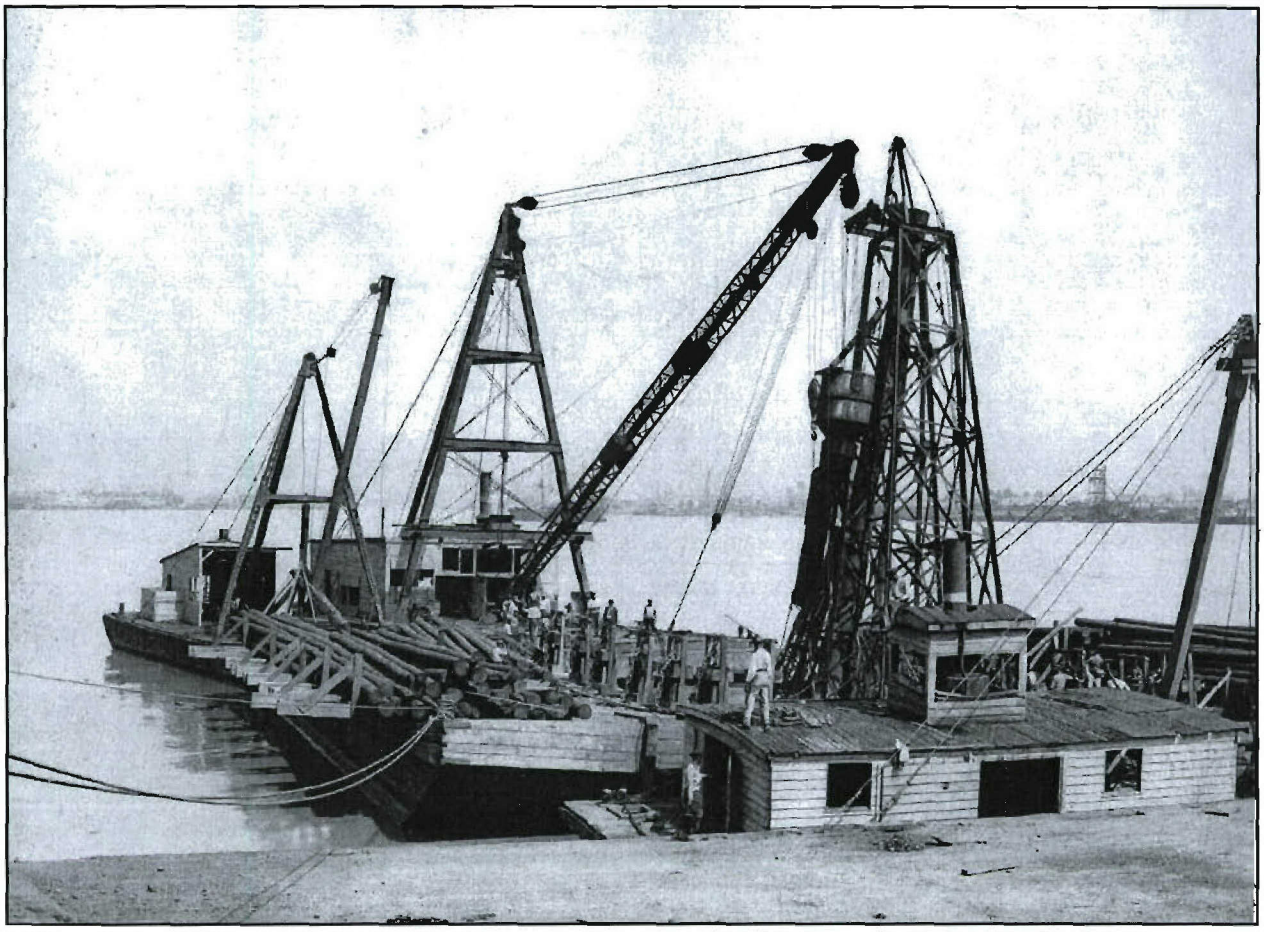


Figure 161. **Photograph showing the *Boaz* engaged in apparently assisting a piledriver sink a row of pilings to be used in wharf construction (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

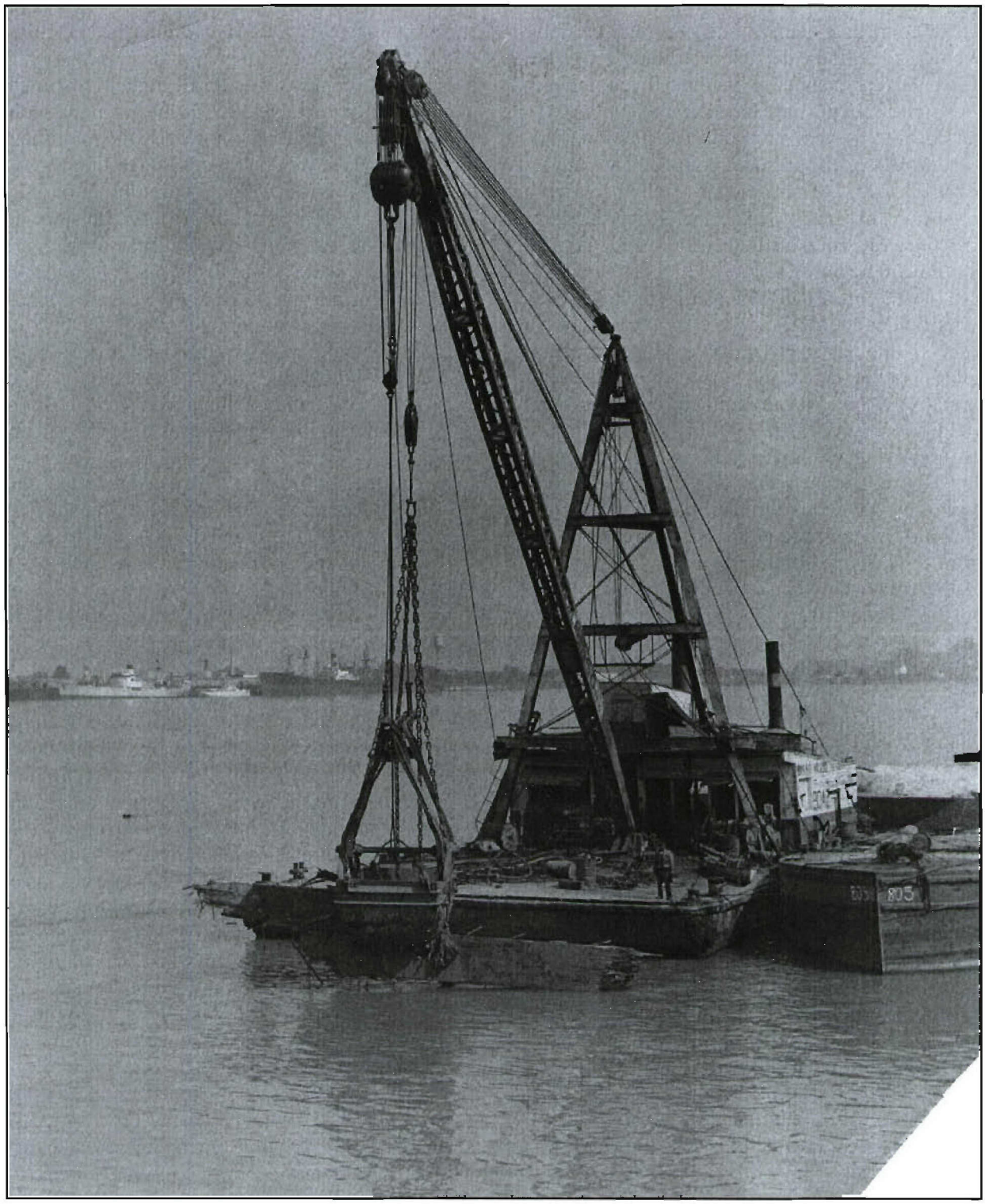


Figure 162. **Post 1963 photograph showing the *Boaz* wrecking out a large wooden structure, possibly a vessel (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

(Figure 163). In what is perhaps the last photograph taken of the *Boaz,* and which was submitted in court as evidence, she is shown partially submerged with the derrick protruding above the water. Divers eventually were deployed, and the "A frame" supporting the derrick's boom was cut down to prevent a hazard to navigation (William A. Bisso, III, personal communication: October 13, 2003). The accident resulted in a very large hole in Bisso Marine Inc.'s operations at the time; the court settlement allowed them to continue in business.

Thus, Site 16OR191 (Shipwreck #3) was identified as the twentieth century derrick barge *Boaz.* Although its exact date of construction could not be determined, the *Boaz* was built prior to 1938 and it sank in the proposed project vicinity on July 28, 1977. This ship fits into a historical theme of marine salvage, construction, and laboring vessels that serviced the city and port of New Orleans and facilitated the construction and maintenance of the New Orleans waterfront. The *Boaz* participated in the 1964 salvage of the Union City class ironclad gunboat *Cairo* on the Yazoo River, Mississippi; however, the Bisso Marine Inc.'s derrick barge *Cairo,* also took part in the salvage, and it still is in operation.

Despite investigation of historical documents and records, the *Boaz* (Shipwreck #3) has not been associated with a person of significant historical interest. There also are many extant examples of derrick barges of this particular type, some that remain in service today, and a great deal is known about their construction and machinery. Therefore, the *Boaz* lacks research potential under Criteria C and D. Its manner of sinking and subsequent demolition and removal as a hazard to navigation no doubt has effected its integrity tremendously and adversely. Thus, the *Boaz* does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional survey or historical research is recommended for this shipwreck.

Site 16OR192 (Shipwreck #4; *Rooster, Napoleon,* or *Samson*)

Shipwreck #4 lies just south of Shipwreck #2, at a river depth that ranges from 7 to 15 m (23 to 49 ft) (Figures 139 and 140). Positioned at approximate River Mile 102.34 on the left descending bank of the Mississippi River, the vessel is located at UTM coordinates N3314060, E776518. Side-scan sonar indicates that Shipwreck #4 consists of a small tugboat that measures approximately 15 m (50 ft) in length, with a beam of 4.6 m (15 ft); however, the multi-beam data provided measurements suggesting the vessel was 20 m (66 ft) long with a beam of 5.5 m (18 ft) (Figure 164; Table 16). Oral history and eyewitness accounts have indicated that three tugs, the *Rooster, Napoleon,* and *Samson,* were lost in this portion of the study area (William A. Bisso, III, personal communication October 13, 2003). Photographic analysis and historic documentation confirm that these vessels had approximately similar dimensions to those recorded during the remote sensing survey (Table 17).

Either the *Rooster, Napoleon,* or the *Samson* may comprise the remains of Shipwreck #4 (Site 16OR192), a tugboat likely constructed at the turn of the twentieth century. Each of the tugboats (*Rooster, Napoleon,* or the *Samson*) that may be represented by Shipwreck #4 is discussed in more detail below.

Tug Rooster

The tugboat *Rooster* was the property of E.N. Bisso and Son, Inc., a commercial tugboat company started in the 1940s. An aerial photograph taken in the 1970s depicts the *Rooster* and *Napoleon* moored side by side (Figure 165). Scaled measurements taken from the photograph indicate that the *Rooster* measured approximately 21.3 m (70 ft) in length, with a beam of approximately 4.9 m (16 ft). Its dimensions are only a little larger than those calculated for Shipwreck #4 based on the remote sensing data. It is appears to be a very similar craft to the *Napoleon,* discussed below, suggesting that it also may be a wooden hulled tug.

No additional documentation for the *Rooster* could be found in the Fort Worth Archives; however, this tug is supposed to have sunk in the same hurricane as the *Napoleon* in the 1970s (William A. Bisso, III, personal communication: October 13, 2003). The recorded dimensions of the *Rooster* closely conform to those measured for Shipwreck #4.



Figure 163. **In what is perhaps the last photograph made of the *Boaz*, she is shown sunk in the river with her derrick protruding above the water. Divers were eventually deployed and the "A frame" supporting the derrick's boom was cut down to prevent a hazard to navigation (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

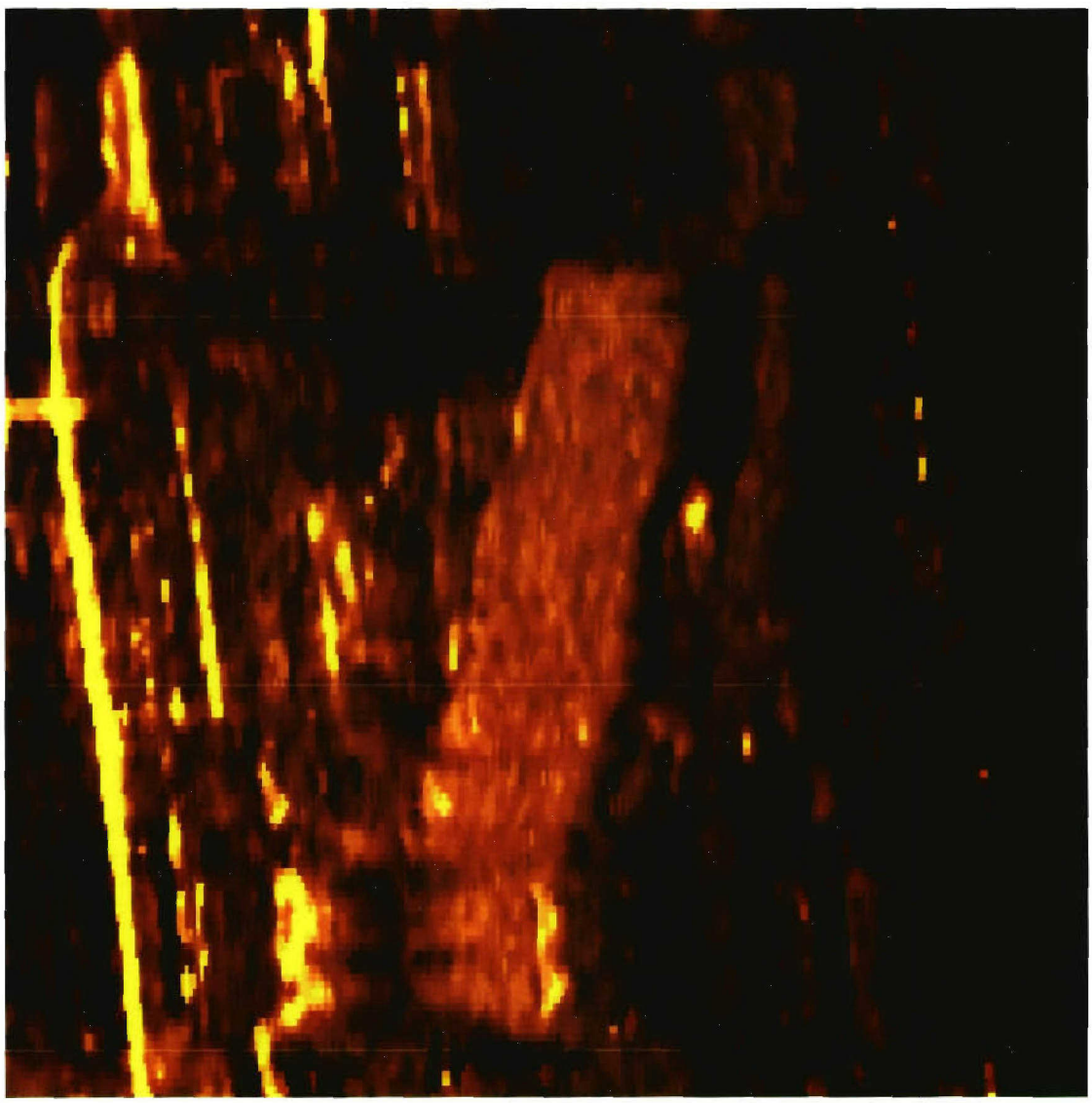


Figure 164. **Side Scan Sonar Image of Shipwreck #4.**

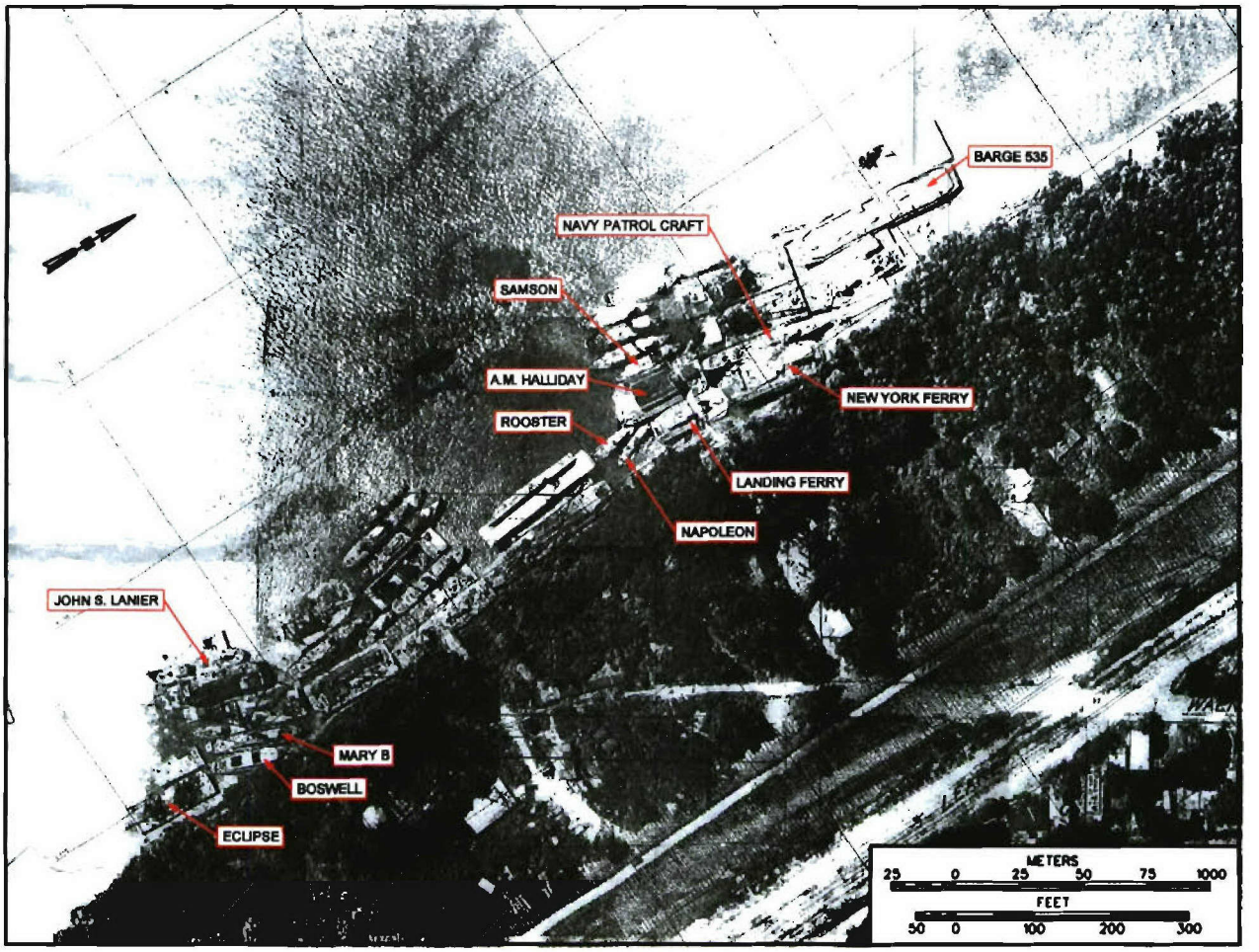


Figure 165. **Aerial photograph depicting numerous vessels docked within the vicinity of the projected area ca. 1970 (Gandoifo, Kuhn & Associates ca. 1970).**

Table 17. Vessels and their dimensions presumed lost within the Area of Potential Effect.

Shipwreck No.	Vessel Name	Built	Vessel Type	Length (ft)	Beam (ft)	Depth (ft)	Gross Tons	Source
1	*Addison Bullard*	1904	Schooner	218.6	42.7	19.9	1,485	List of Merchant Vessels of the United States 1905
2	*Gouldsboro*	1863	Railroad Ferry	206	52.4	9	469	Enrollment Book No. 12, October 1, 1907 to June 30, 1911
3	*Boaz*	N/A	Derrick Barge	96	N/A	N/A	N/A	National Transportation Safety Board 1978
4	*Napoleon*	1888	Tug	60	15	7	43	Enrollment Book No. 10, March 20, 1900 to June 30, 1905
4	*Rooster*	N/A	Tug	70	16	N/A	N/A	Gandoifo, Kuhn & Associates ca. 1970
4	*Samson*	1881	Tug	108	22.1	10.6	159	Enrollment Book No. 10, March 20, 1900 to June 30, 1905
5	*Ajax*	N/A	Derrick Barge	100	50	4	150	Corps of Engineers 1962
6	Navy Patrol Craft	N/A	Warship	180	22	N/A	N/A	Gandoifo, Kuhn & Associates ca. 1970
7	*E.N.B. Barge 535*	N/A	Barge	230	N/A	N/A	N/A	National Transportation Safety Board 1978
8	Unnamed Tank Barge	N/A	Tank Barge	120	N/A	N/A	N/A	National Transportation Safety Board 1978
8	*Boswell*	ca. 1890	Tug	125	25	N/A	311	Bachrach & Co. 1963
8	*Eclipse*	ca. 1923	Coaling Barge	110	35	7	N/A	Bachrach & Co. 1963
8	*John S. Lanier*	N/A	Water Barge	120	24	N/A	N/A	Gandoifo, Kuhn & Associates ca. 1970
9	New York Ferry	N/A	Ferry	136	50	N/A	N/A	Gandoifo, Kuhn & Associates ca. 1970
11	*A. M. Halliday*	1903	Catamaran Ferry	121	59	7.7	207	Record of Enrollments from July 2, 1937 to March 29, 1941
10	Unknown	N/A	Barge	80	40	N/A	N/A	Multi-Beam Data
13	*Mary B.*	ca. 1903	Tug	121.5	24.5	15	269	Bachrach & Co. 1963
14	*Tyler*	1920	Sternwheel Pushboat	120	24.8	5.7	205	Record of Enrollments from September 27, 1929 to June 30, 1932
15	Landing Ferry	/	Ferry	108	38	N/A	N/A	Gandoifo, Kuhn & Associates ca. 1970
16 - 19	Unknown							

Tug Napoleon

The tugboat *Napoleon* was built of iron in 1943. The *Napoleon* measured 23 m (75 ft) in length, 4.5 m (14.8 ft) in breadth, and its depth was 2 m (7 ft); it yielded a net tonnage of 14 tons. This vessel had 320 horsepower engines and a 7.6 m (25 ft) tall staff on its deck (Corps of Engineers 1962:35). The *Napoleon* became part of the Bisso fleet as early as 1952, when it was operated by one of the subsidiary companies, Victory Towing Company (Corps of Engineers 1952). By 1955, this company was incorporated as the Bisso Ferry Company before becoming E.N. Bisso and Son, Inc., sometime around 1959 (Corps of Engineers 1955, 1959). It does not appear in these transportation studies after 1963, suggesting the Napoleon was no longer in use as a tugboat.

The *Napoleon* does not appear in any of the surveys and valuations carried out by Bachrach & Co., Inc., in 1963. However, it is depicted in an aerial photograph taken sometime during the 1970s, corroborating that it was lost thereafter when it sank in the proposed project area during a hurricane (William A. Bisso, III, personal communication: October 13, 2003). The recorded dimensions of the *Napoleon* closely conform to those measured for Shipwreck #4.

Tug Samson

The *Samson* is another tugboat that sunk in the project area. The *Samson* was constructed of iron in 1881 in the shipyards of Camden, New Jersey; it came to New Orleans via Galveston, Texas, where it was enrolled previously. The vessel was a screw steamer with a single deck,

two masts, a straight head, and a round stern. It measured 33 m (108 ft) in length and 6.7 m (22.1 ft) in beam, and it drew 3.2 m (10.6 ft). The *Samson's* capacity under the tonnage deck was 142.58 tons. The vessel had a crew room forward with a capacity of 7.7 tons, and an aft cabin with a capacity of 9.56 tons. The gross tonnage of 159.84 was rounded to 159, while the net tonnage was calculated at 79. The Board of Commissioners of the Port of New Orleans acquired the *Samson* and duly enrolled her on April 14, 1905 with Certificate No. 34, official number 115791 (Enrollment Book No. 10, March 20, 1900 to June 30, 1905:201).

The above-mentioned document indicates that the *Samson* probably was an ocean-going tug equipped with crew quarters and most likely a galley. It was purchased and equipped by the Board of Commissioners of the Port of New Orleans as a fireboat capable of fighting fires on waterfront wharves, as well as on ships. The *Samson* was re-enrolled on October 14, 1907 and again on September 11, 1913, when the officers of the Board of Commissioners of the Port of New Orleans changed (Enrollment Book No. 12, October 1, 1907 to June 30, 1911:2; Enrollment Book No. 13, July 1, 1911 to June 30, 1914:138). It was re-enrolled once more on September 27, 1929, and issued Certificate No. 25 (Record of Enrollments from September 27, 1929 to June 30, 1932:221). Another enrollment occurred on September 1, 1932, when the *Samson*, then an oil burner still owned by the Board of Commissioners of the Port of New Orleans, was issued Certificate No. 26; the original tonnage figures and dimensions had not changed from the first enrollment (Record of Endorsements of Change of Master July 1933 to December 1941:8; Cert. No. 26, Record of Enrollments from July 1, 1932 to June 30, 1937).

The Record of Endorsements of Change of Master indicates that the *Samson* had a change of master in October 1934, when Edward R. Lauterback replaced R.J. Bougioux as Captain. In March 1940, Lauterback was replaced by Marion F. Short. While under the command of Short, the *Samson* was re-enrolled at New Orleans on July 17, 1940, and issued Certificate No. 21; it still was owned by the Board of Commissioners of the Port of New Orleans (Cert. No. 21, Record of Enrollments from July 2, 1937 to 2, 1937 to March 29, 1941). In June of the following year, Sylvan Yuratech replaced Short as captain (Record of Endorsements of Change of Master July 1933 to December 1941: 8, 68, 97).

There are numerous enrollment documents for the *Samson*; however, it is unclear when the Bisso family acquired this tugboat. This change in ownership likely occurred sometime prior to 1952, when it was operated by Victory Towing Company; later, it was operated by Bisso Towing Company in 1955. By 1959, the company's name had changed again to E.N. Bisso and Son, Inc. (Corps of Engineers 1952, 1955, 1959). These documents also indicate that the *Samson* was rebuilt in 1924 (Corps of Engineers 1955:18). It was still in operation as a towboat for E.N. Bisso and Son, Inc., in 1963 (Corps of Engineers 1963:36).

The *Samson* was reported lost in a hurricane, and today it lies submerged somewhere in the vicinity of the project area (William A. Bisso, III, personal communication: October 13, 2003); however, no shipwreck in the proposed project area could be identified or equated with the *Samson* based on the available data. The recorded dimensions of the *Samson* exceed those measurements of Shipwreck #4 provided by the remote sensing; i.e., there is a difference of 15.3 m (50 ft) in the vessel's length and 1.7 m (5.6 ft) in the beam.

All three of these tugs represent now sunken examples of a common vessel type represented in the existing inventory of viable watercraft and in the archival record. Thus, Shipwreck #4 lacks research potential and the qualities of significance as defined in the National Register criteria (36 CFR 60.4 [a-d]).

Site 16OR193 (Shipwreck #5; *Ajax*)

Shipwreck #5 was recorded just north of the main pier facility of Bisso Marine, Inc., at river depths that range from 21 to 29 m (70 to 96 ft) (Figures 139 and 140). Positioned at UTM coordinates N3313987, E776473, Shipwreck #5 was identified at approximate River Mile 102.29 on the left descending bank of the Mississippi River, and it is stacked directly below Shipwreck #6. This vessel measures approximately 22.9 to 29 m (75 to 96 ft) in length with a beam that ranged from 14.6 to 16.8 m (48 to 55 ft) (Table 16). The stacking of the two vessels,

however, is masking the total length of Shipwreck #5, and it may be affecting the calculation of beam width due to hull collapse (Figure 166). Sidescan sonar images depict the possible remains of a derrick and support structure. Based upon the sidescan sonar image, oral interviews, and historical data, this vessel appears to be the derrick barge *Ajax* (William A. Bisso, III, personal communication: October 13, 2003).

Despite intensive research, very little historical data pertaining to the *Ajax* could be obtained. It is likely that it was constructed in the early 1900s. The *Ajax* consisted of a steel derrick barge engaged in salvage and lifting. It is not known when the New Orleans Coal and Bisso Towboat Company purchased the vessel, although it was not any later than 1962 (Corps of Engineers 1962:233). This barge had a documented length of 30.5 m (100 ft), a beam of 15.2 m (50 ft), and a registered depth of 1.2 m (4 ft) (Table 17) (Corps of Engineers 1962:233). The vessel had a net tonnage figure of 150 tons, and it carried a 12.2 m (40 ft) boom (Corps of Engineers 1962:233). In 1963, during the assessment of the New Orleans Coal and Towboat Company fleet, Bachrach & Co., Inc., valued the *Ajax* at $30,000.00 (Bachrach & Co., Inc. 1963). In 1964, the *Ajax* was one of four Bisso Marine, Inc., derrick barges used to salvage the *Cairo*, one of a number of Union City class ironclad river gunboats that sank during the Civil War.

Historical and remote sensing data suggest that Site 16OR193 (Shipwreck #5) represents the twentieth century derrick barge *Ajax* that sank in the project area at an unspecified date. The *Ajax* was one of many derrick barges whose working history is tied to the Mississippi and other western rivers; this is a common vessel type that remains in service today, and that is well documented. In fact, the *Cairo*, another local derrick barge given the same name as the aforementioned Civil War vessel, is still in service today. The *Ajax* (Shipwreck #5) has not been associated with persons of significant historical interest. Due to its ubiquity and the survival of exemplars of this class that possess integrity, the *Ajax* lacks research potential. Thus, Site 16OR193 does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional survey or historical research is recommended for this vessel.

Site 16OR194 (Shipwreck #6; WWII Naval Patrol Craft)

Shipwreck #6 lies at approximate River Mile 102.27 on the left descending bank of the Mississippi River; it rests at river depths that range from 26 to 31 m (86 to 101 ft) (Figures 139 and 140). Positioned at UTM coordinates N3313958, E776455, Shipwreck #6 is located with its bow lying over Shipwreck #5 at a 90° angle (Figure 166). Analysis of the remote sensing data indicates that the vessel measures approximately 48.8 to 54.8 m (160 to 180 ft) in length with a beam of 6 to 9 m (20 to 30 ft) (Table 16). Oral history, eyewitness accounts, and historical documentation indicate that Shipwreck #6 consists of a World War II era naval patrol craft that was lost in this immediate vicinity of the study area (William A. Bisso, III, personal communication: October 13, 2003).

Photographic analysis and historical documentation confirm that this vessel had similar dimensions to those recorded during the remote sensing survey (Table 17). For example, scaled measurements taken from a ca. 1970 photograph indicate that this navy patrol craft measured approximately 53.3 m (175 ft) in length, with a beam of approximately 6.9 m (22.5 ft); these dimensions fall within the measured range of Shipwreck #6 provided by the remote sensing data (Figure 165).

During World War II, the Navy built over 300 patrol craft for use as antisubmarine ships. Initially built to combat Germany's U-boat campaign against Great Britain, these patrol craft also became control ships that led landing craft in invasions, shot aircraft from the skies, and sank small ships. Nearly 50,000 men served on these rough but rugged ships, which were used in both the Atlantic and Pacific Ocean arenas (Veigele 2003). After the war, most of the patrol craft went to scrap yards; however, some continued their duty in the United States and other Navies for decades, and a number are still in service.

Depending on the intended use of the vessel, these crafts varied in size and crew complements. Small patrol craft carried 180 crewmen,



Figure 172. **Photograph showing the deteriorated condition of the *Boswell* in 1963 (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

1950, 1959:30). The *Eclipse* was surveyed in 1963 by Bachrach & Co., Inc., for the estate of Captain W. A. Bisso Sr. The hull of the *Eclipse* was estimated at 40 years old at the time of this 1963 survey, putting its construction date around 1923; it was built by Johnson Iron Works at New Orleans. The vessel was made of riveted steel specifically used for the coaling trade. The vessel measured 34 m (110 ft) in length, 11 m (35 ft) in width, and 2.4 m (8 ft) deep; it was raked at both ends (Bachrach & Co, Inc., 1963).

The barge itself had a typical rectangular construction, which supported a number of shelters for men and machinery. On its deck were located a steam powered winch, a lever station, and a manual capstan; a deckhouse was situated beneath the base of the coal tower (Figure 173). Figure 174 depicts a water tank, part of the deckhouse and base of the coal tower, as well as the deteriorated decking at the time of the 1963 appraisal survey. The coal towers themselves were tall structures, presumably to facilitate the transfer of coal over a range of differing heights (Figure 175). Another aspect of this transfer vessel was the landward conveyor belt machinery (Figure 176). This photograph indicates that the machinery was belt driven with a centrifugal governor. Figure 177 depicts a coal conveyor belt with a load of coal being transferred to the top of the coal tower at an angle of 30 degrees. This equipment provided efficient transfer of large amounts of coal to waiting ships or barges for purpose of powering steam vessels, as well as for shipping up or down river.

Mounted on the aft end of the *Eclipse* was a 10-ton Whirly steam derrick; a coaling tower was mounted amidships. The boiler was fixed aft of amidships, and it had a three drum steam skip hoist mounted on the forward end. At the time of the 1963 survey, most of the winches, pumps, and other machinery was inoperable or missing, and the *Eclipse* had been in idle status since 1955. At this time, it was estimated to have had a scrap value of $3,500.00; it also was reported in sinking condition (Bachrach & Co, Inc., 1963). The *Eclipse* was lost in a hurricane (post 1963), and today it lies within the project area (William A. Bisso, III, personal communication: October 13, 2003). It also has similar dimensions to those recorded by the remote sensing survey for Shipwreck #8.

Water Barge John S. Lanier

The *John S. Lanier* was used to convey fresh water to vessels operating on the river or preparing for an ocean voyage. An aerial photograph taken in the 1970s depicts the *John S. Lanier* tied up among the rest of the Bisso work fleet (Figure 165). Based on this figure, the vessel measured approximately 36.6 m (120 ft) in length, with a beam of approximately 6.1 m (20 ft); these dimensions fall within the calculated range of Shipwreck #8 provided by the remote sensing data. The *John S. Lanier* is depicted as a bluff ended barge rounded at both ends, confirming its use offshore in the watering business. An aft deckhouse housed the crew and the pumping equipment and controls.

The *John S. Lanier* was valued at $3,000.00 in 1963 (Bachrach & Co., Inc. 1963). This vessel was reported sunk in the project area, possibly in one of the many storms that affected the area (William A. Bisso, III, personal communication: October 13, 2003).

Although precise identification of Shipwreck #8 cannot be made from existing remote sensing data, the preponderance of the evidence, including valuation surveys, 1970s air photos, eyewitness accounts, enrollment records, and the direct historical approach indicate that this vessel is one of three known to have been lost in the project area. As indicated above, these three vessels variously were stripped (*Boswell* and *Eclipse*), and scrapped, and already had lost many of their character-defining features at the time they were sunk, or, like the *John S. Lanier*, they are conventional examples of ubiquitous vessel types already preserved in the archival record or readily accessible in better condition elsewhere. In any event, Shipwreck #8 does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No further work is recommended for this sunken vessel.

Site 16OR197 (Shipwreck #9; Unnamed New York Ferry or Tank Barge)

Shipwreck #9 is positioned north of the main pier facility of E.N. Bisso and Son, Inc., at a river depth that ranges from 19.5 to 31 m (64 to 102 ft) (Figures 139 and 167). Positioned at UTM coordinates N3313854, E776434, Shipwreck #9 was identified at approximate River

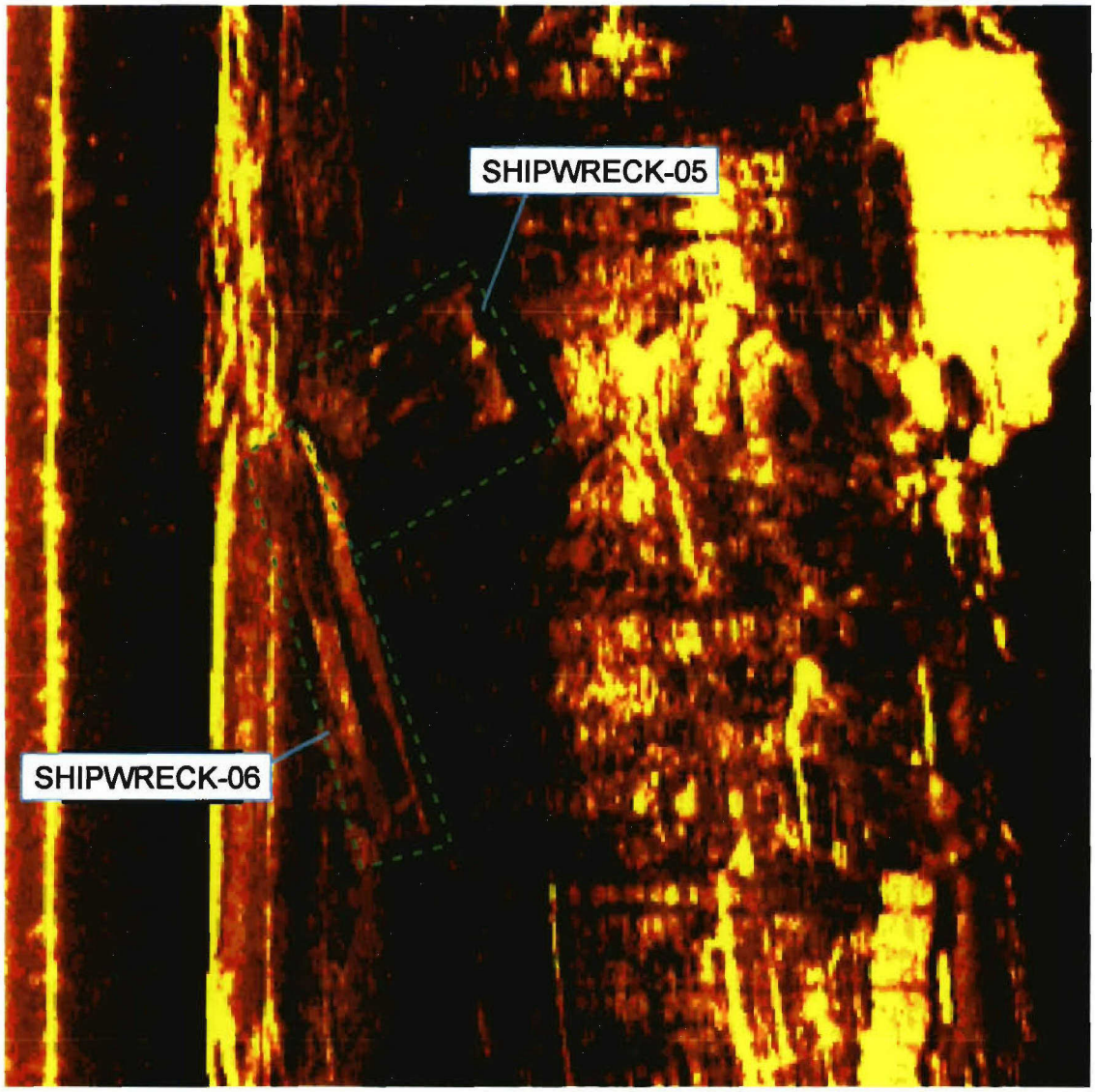


Figure 166. **Side Scan Sonar Image of Shipwrecks #5 and #6.**

while larger vessels were manned by a maximum of 292 men. Vessel dimensions ranged from 61 to 100 m (200.5 to 328.6 ft) in length with a beam of 10.7 to 12.6 m (35 to 41.3 ft) and a draft of 3.7 to 4.3 m (12.1 to 14.1 ft) (Clancey 2003). Navy patrol craft utilized either turbines or reciprocating engines that could reach speeds of 11 to 20 knots.

Despite intensive research, this investigation failed to recover detailed information concerning the name of this ca. 1940s navy patrol craft and its past history. Furthermore, it is not known when the Bisso family purchased the vessel. However, the vessel was purchased for its engines, which were removed and installed in a company tug during a refit (William A. Bisso, III, personal communication: October 13, 2003). The navy patrol craft reportedly sank in the project area after 1970. As an exemplar of a class, this vessel is a stripped and salvaged specimen of a well-known and thoroughly documented type, a number of which remain in service today. Its history at the Bisso yards documents its lack of integrity. Site 16OR194 (Shipwreck #6) does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional work is recommended.

Site 16OR195 (Shipwreck #7; *E.N.B. Barge 535*)

Shipwreck #7 is positioned south of the main pier facility of Bisso Marine, Inc., north of the main pier of E.N. Bisso & Son, Inc., at river depths between 12.5 to 21.6 m (41 to 71 ft) (Figure 139). Positioned at UTM coordinates N3313855, E776471, Shipwreck #7 was identified at approximate River Mile 102.20 on the left descending bank of the Mississippi River. An analysis of the remote sensing data indicated that the wreck measured approximately 67 to 70 m (220 to 230 ft) in length, with a beam of 12.2 m (40 ft) (Figure 167). In addition, a small, submerged work barge that measured approximately 9 x 6 m (30 x 20 ft) in size was identified on its deck (Figure 168).

Oral history, eyewitness accounts, and similarity in vessel dimensions suggest that Shipwreck #7 comprises the remains of *E.N.B. Barge 535*. This craft consisted of a steel barge built in 1925; it transported miscellaneous cargo for E.N. Bisso & Son as early as 1959 (Corps of Engineers 1959:30). This barge measured approximately 73 m (240 ft) in length, with a beam of approximately 13.7 m (45 ft); these dimensions are within the calculated range of Shipwreck #7 provided by the remote sensing data. A ca. 1970 aerial photograph of *E.N.B. Barge 535* depicts the barge with a raked bow, and possibly stern, as well (Figure 165).

This barge was documented in the National Transportation Safety Board report as one of two barges sunk in the marine accident involving the French flagged tanker *Sitala* on July 28, 1977 (National Transportation Safety Board 1978:10). A photo taken shortly after the collision shows *E.N.B. Barge 535* listing to starboard; tied to the starboard side was an unnamed tanker barge (discussed below) (Figure 169). Appearing as the larger of the two barges depicted in the photograph, *E.N.B. Barge 535* was identified as a deck barge at the time of the collision. In addition, two large boilers and a great deal of other salvaged material were situated on the deck, indicating long-term storage. The salvaged material was dumped during the sinking event that was captured in a series of color photographs. The photos depict the bow tilted in the air and sliding underwater on the port side (Figure 170).

It should be noted that two boilers also were identified within the submerged portion of the proposed project area. These boilers, as well as a smokestack, were recorded by the sidescan sonar and are flush with the sediment surface (Figure 171). The boilers may be associated with the deck load of boilers and scrap iron that was lost when several barges were sunk as a result of the *Sitala* collision in 1977.

As the discussion above suggests, Site 16OR195 (Shipwreck #7) comprises the twentieth century barge identified as *E.N.B. Barge 535,* constructed in 1925 and sunk on July 28, 1977 when it was struck by the tanker, *Sitala.* This barge is one example of numerous barges that remain in service today, either for transport or as storage. Shipwreck #7 lacks research potential and it also has not been associated with persons of significant historical interest. Thus, Site 16OR195 does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36

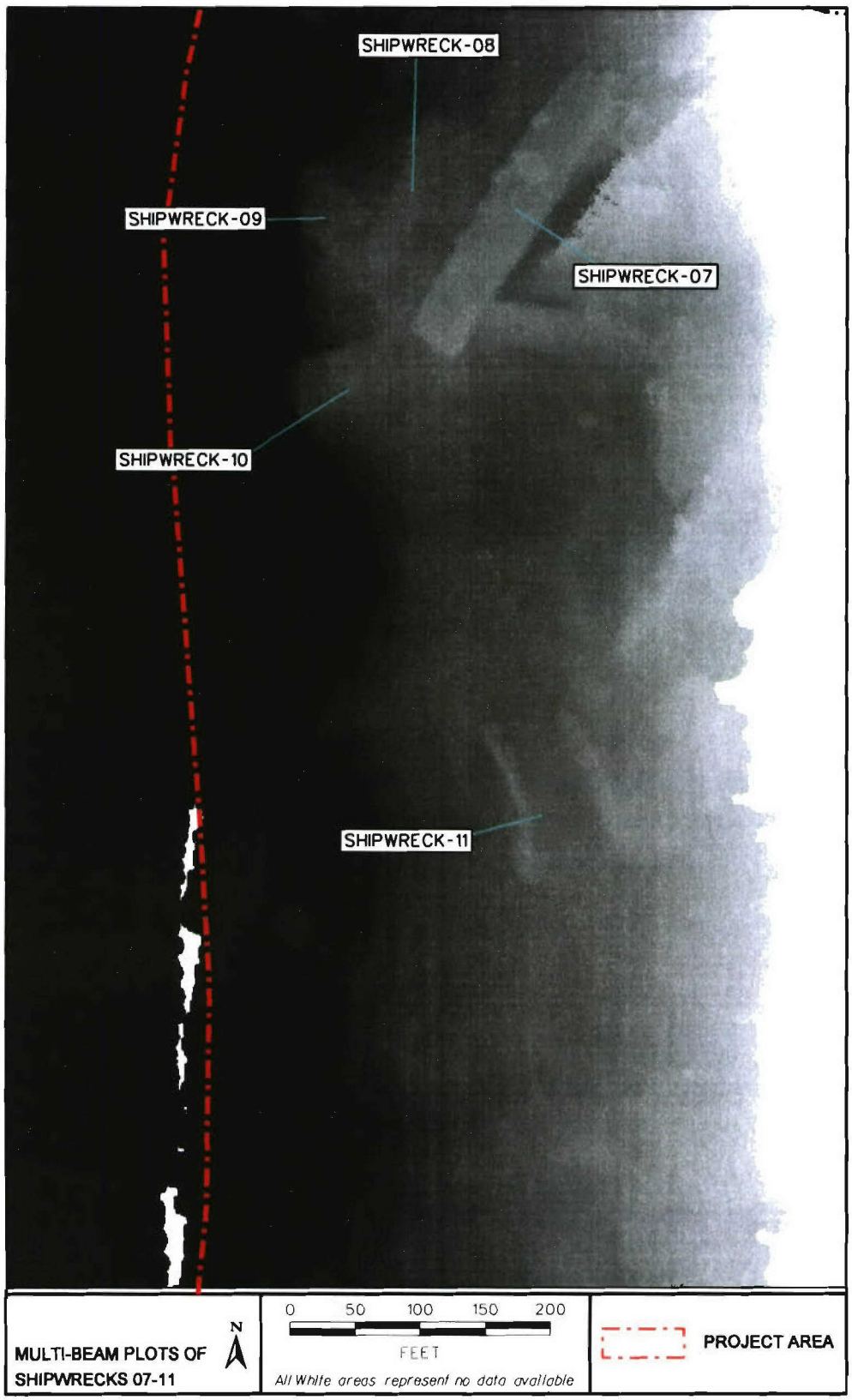


Figure 167. Multi-Beam Grid Plot of Shipwrecks #7 - #11.

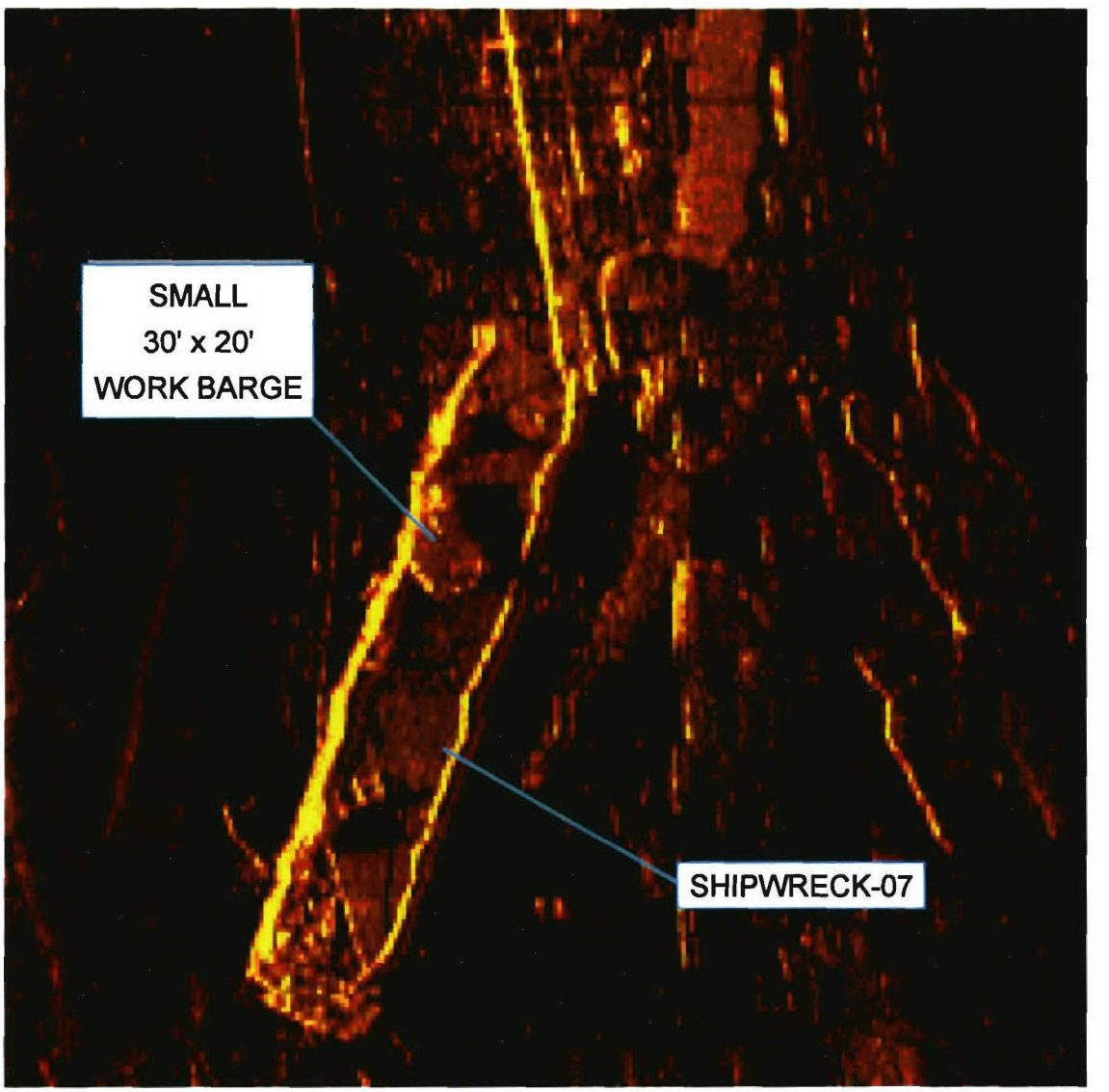


Figure 168. **Side Scan Sonar Image of Shipwreck #7.**



Figure 169. **A photo taken shortly after the collision shows *E.N.B. Barge 535* listing to starboard. Tied to her starboard side is the unnamed tank barge (Photo courtesy William A. Bisso, III Historic Photograph Collection).**



Figure 170. Photographs showing (extreme left, photos 1 and 2) *E.N.B. Barge 535* (foreground, photos 1, 2, and 3) and in the process of sinking. The photos show her bow tilted in the air and sliding underwater on her port side (Photo courtesy William A. Bisso, III Historic Photograph Collection).

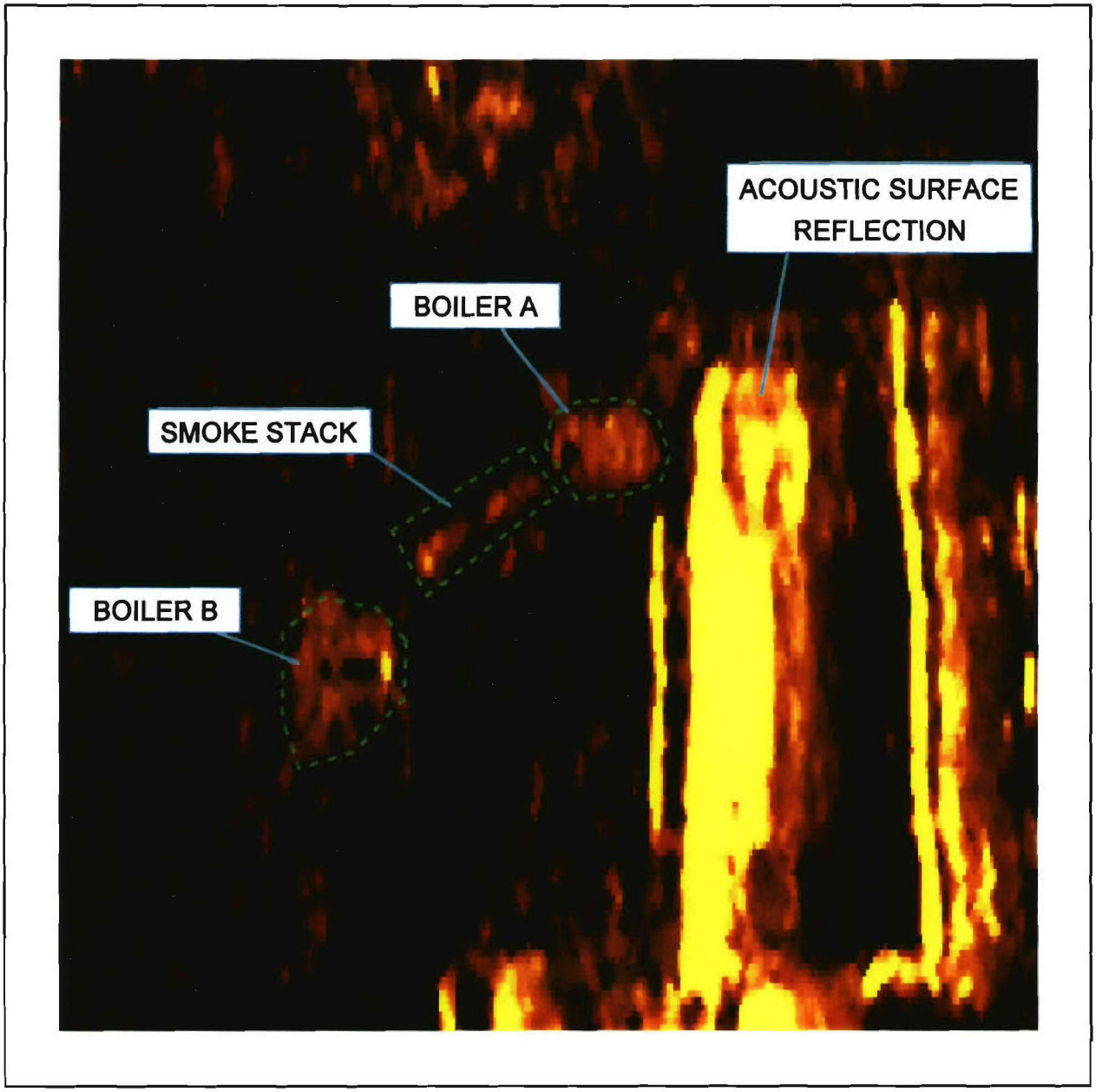


Figure 171. **Side Scan Sonar Image of Two Boilers and Smoke Stack.**

CFR 60.4 [a-d]). No additional survey or historical research is recommended for *E.N.B. Barge 535.*

Site 16OR196 (Shipwreck #8; *Boswell, Eclipse,* or *John S. Lanier*)

Shipwreck #8 is located in the middle of the study area, and portions of its hull are superimposed on Shipwreck #9 (Figures 139 and 167). Lying at river depths of 21.6 to 22.6 m (71 to 74 ft), this vessel is positioned at approximate River Mile 102.20 on the left descending bank of the Mississippi River; i.e., at UTM coordinates N3313862, E776448. Sidescan sonar of the vessel indicated that Shipwreck #8 measured approximately 36 to 36.6 m (118 to 120 ft) in length by 6 to 7.6 m (20 to 25 ft) in width (Table 16). Based upon the variation in measurements taken from both the sidescan and multi-beam, this vessel appears to represent the remains of one of three recorded shipwrecks known to be located within the Area of Potential Effect (William A. Bisso, III, personal communication: October 13, 2003). Three wrecks, consisting of the *Boswell*, *Eclipse*, and the *John S. Lanier*, had approximately similar dimensions to those recorded during the remote sensing survey (Table 17). Documents that recorded vessels employed on the Mississippi River provide names and dimensions for numerous tugboats and barges owned by the various companies of the Bisso family (Corps of Engineers 1959, 1960, 1961, 1962, 1963, and 1969). Each of the three vessels that may represent Shipwreck #8 (*Boswell, Eclipse*, and the *John S. Lanier*) is discussed below.

Tug Boswell

The *Boswell* was a single screw propeller steam tug, originally built as an outside, or ocean-going, hawser tug that later was converted for service on inland rivers by Federal Barge Lines, Inc. This tugboat was built in Camden, New Jersey ca. 1890, and it was constructed of riveted charcoal iron. It was documented as weighing 311 gross tons, with an official number of 130152 (Bachrach & Co, Inc., 1963). It is not known when the New Orleans Coal & Bisso Towboat Co., acquired the vessel; however, it was purchased for $6,000.00.

While in service, eight men manned the Boswell, and it required an engineer on throttle duty when underway or on standby. It had a flush deck, a model bow, overhang stern, and a wooden superstructure. The vessel's documented measurements were recorded as 38.1 m (125 ft) in length, and it had a breadth of 7.6 m (25 ft); its draft forward was 2.7 m (9 ft), with 3.6 m (12 ft) aft draft. The freeboard amidships was 121.9 cm (48 in). It had an oil burning, Scotch marine boiler with three burners. Its total fuel capacity was estimated at 900 barrels or approximately 50,000 gallons, and its daily consumption was estimated at some 60 barrels, or 3,300 gallons, a day (Bachrach & Co, Inc., 1963).

The *Boswell* was included in the group of vessels that were assessed by Bachrach & Co., Inc., for fair market value following the death of W. A. Bisso Sr. in 1963. At the time of the survey, the *Boswell* had not been operated for seven years and it was reported to require the bilge pumps to operate all the time to keep it afloat (Figure 172). In addition, the main power plant had been removed and scrapped, along with the majority of the other machinery and equipment. The *Boswell's* berthing and cooking facilities also were non-serviceable in 1963. It was valued at $4,000.00 for scrap, as there was negligible demand for such a vessel at the time (Bachrach & Co, Inc., 1963).

It is unclear when the Boswell was lost; however, it likely was due to foundering in severe weather (William A. Bisso, III, personal communication: October 13, 2003). Furthermore, since it appears in the 1963 Bachrach & Co., Inc., assessments, as well as in an aerial photograph taken during the 1970s, it is clear that the *Boswell* did not sink prior to 1970. The recorded dimensions of the *Boswell* conform closely to those measured for Shipwreck #8.

Coaling Barge Eclipse

The coaling barge *Eclipse*, also known as a transfer, served the specialized function of transferring coal via a conveyor to waiting vessels or similar coal barges. Operated by the New Orleans Coal and Bisso Towboat Co., as late as 1950 for transporting coal, by 1959 it was engaged in salvage and lifting (Corps of Engineers



Figure 173. **Photo showing the deck of the *Eclipse* where are located a steam powered winch, a lever station and a trusty old manual capstan. A deckhouse of sorts is located beneath the base of the coal tower (Photo courtesy William A. Bisso, III Historic Photograph Collection).**



Figure 174. **Photo showing the water tank, part of the deckhouse, and base of the coal tower as well as the deteriorated decking of the *Eclipse* at the time of the survey (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

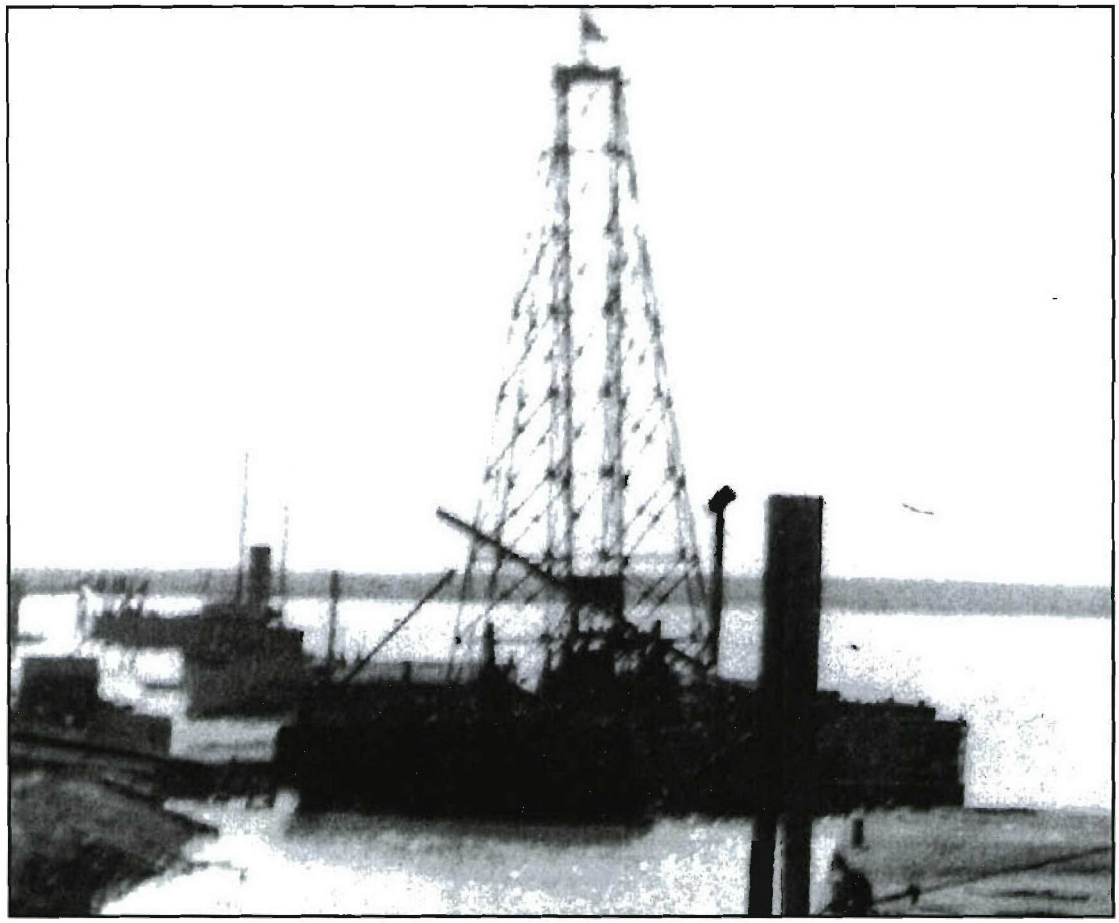


Figure 175. **This photograph shows a tower of the sort that was used by coal transfers (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

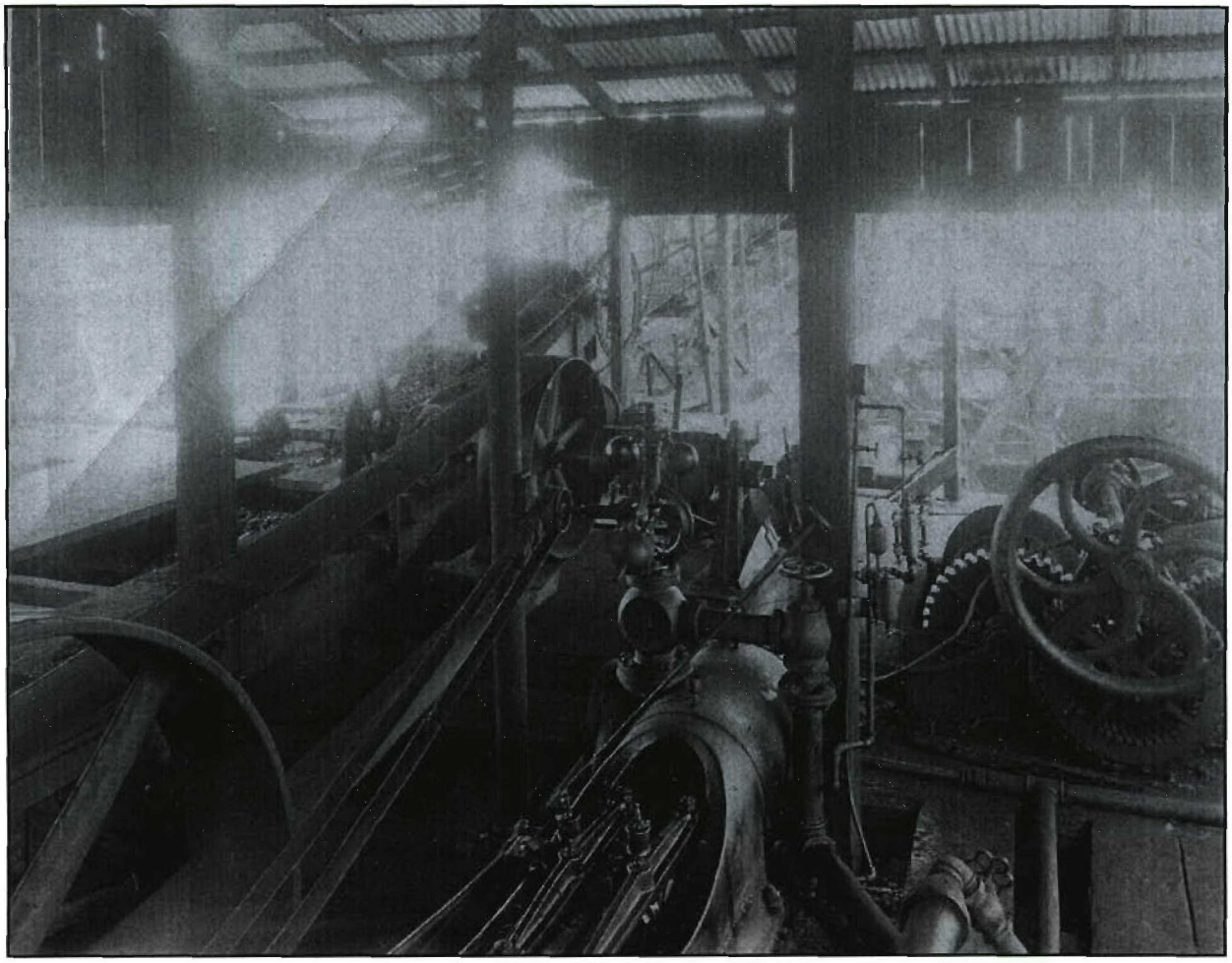


Figure 176. **Photograph showing the conveyor belt machinery ashore. Machinery was belt driven with a centrifugal governor (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

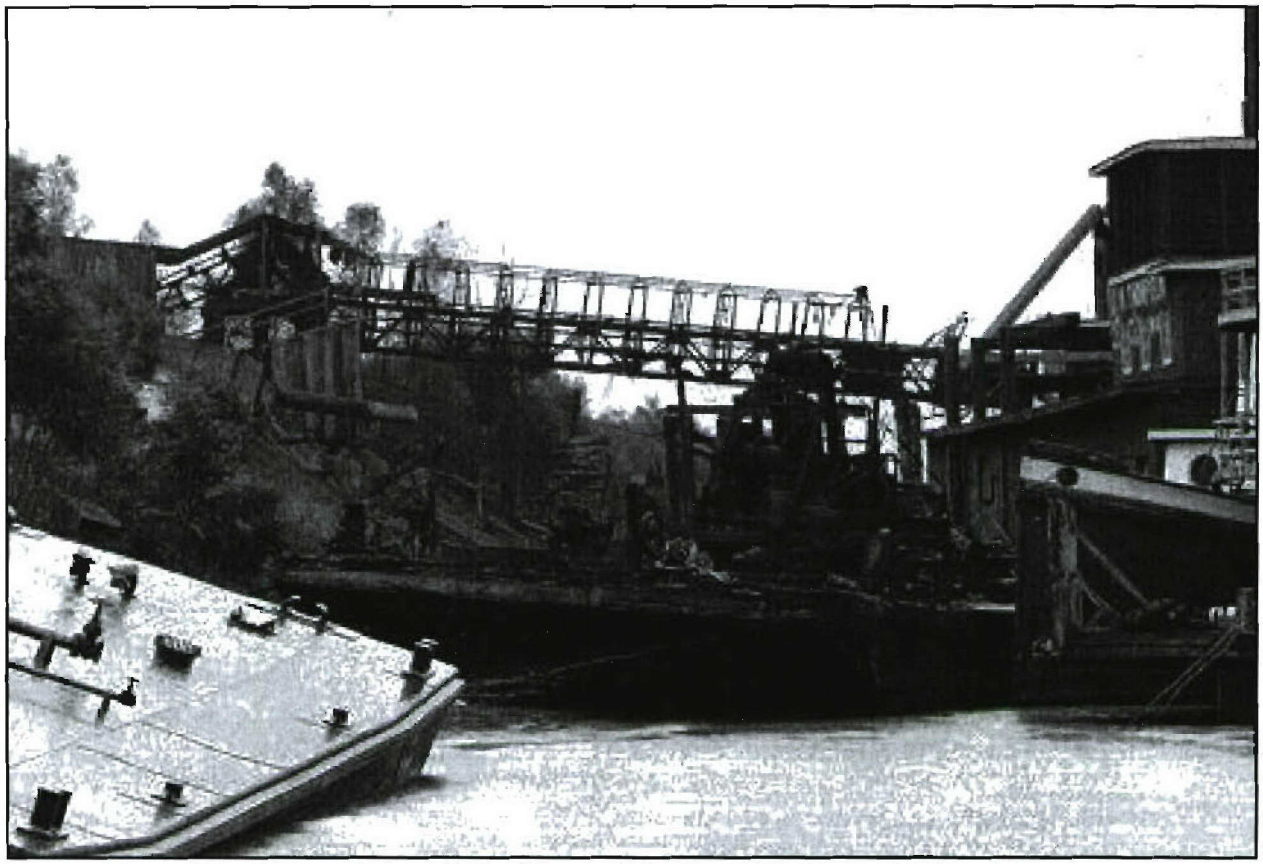


Figure 177. **Photograph showing a coal conveyor belt that transferred coal across the bank to a waiting vessel or tower (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

Mile 102.20 on the left descending bank of the Mississippi River; it is buried directly below Shipwreck #8 at a 90° angle (Figure 178). This vessel measures approximately 39.6 m (130 ft) in length, with a beam of approximately 9.1 to 12.2 m (30 to 40 ft) (Table 16). The stacking of the two vessels (i.e., Shipwrecks #8 and #9) has caused deformation of Shipwreck #9 by sinking and stacking. Based upon the measurements and oral history, this vessel is associated with either an unnamed New York ferry or an unnamed tank barge that sank in 1977. The Corps of Engineers (1950, 1952, 1955, 1959, 1960, 1961, 1962, and 1963) recorded numerous ferries and barges that were employed on the Mississippi River and owned by the various companies of the Bisso family.

New York Ferry

Archival research and interviews with William A. Bisso, III concerning this vessel failed to identify the name, date of construction, actual dimensions, or information regarding a date or reason for its loss. Identified in this report as a New York ferry, a name derived simply from that fact that the ferry was purported to have been built in New York (William A. Bisso, III, personal communication: October 13, 2003), photographic analysis confirmed that this vessel had approximately similar dimensions to those recorded during the remote sensing survey. Scaled measurements taken from a 1970s aerial photograph of the project area indicated that this vessel measured approximately 41.5 m (136 ft) in length, with a beam of approximately 15 m (50 ft) (Figure 165). No additional information regarding this vessel was readily available.

Unnamed Tank Barge

Similarly, little information was obtained during the course of this investigation concerning a tank barge that was lost as a result of the *Sitala* accident that occurred on July 28, 1977 (Figure 169). Tanker barges are "dumb barges," which have no power or means to move in the water without the assistance of a tug or pushboat, or by pulling on lines secured to docks, vessels, or other barges.

The National Transportation Safety Board report of the vessel's sinking suggests that it measured 36.6 m (120 ft) in length; no beam or draft measurements were recorded (National Transportation Safety Board 1978:10). This craft was rectangular in form, with flat ends and sharp corners. The sinking of this unnamed barge is depicted in a series of three photographs (Figure 170). The first photograph depicts this barge in the extreme left hand corner, with a number of metal objects positioned on the deck. In the second photo, the items on deck are gone, having slipped off the deck and into the river. A number of hull ports are visible, as are the bollards, on the high corner of the barge. The third photograph shows the barge finally sinking beneath the water.

Both of the abovementioned vessels sank in the late 1970s. Because of the photographic documentation and the National Transportation Safety Board records, it is likely that Shipwreck #9 represents the barge at the location of its recorded loss. In any event, neither of these vessels possesses substantive research potential or the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]).

Site 16OR198 (Shipwreck #10; Unknown Vessel)

Shipwreck #10 is positioned adjacent to the left descending bank of the Mississippi River at approximate River Mile 102.18. The vessel is situated at UTM coordinates N3313816, E776441, at river depths that range from 23.5 to 32 m (77 to 105 ft) (Figure 139). The vessel is located in the center of the study area, and it is situated beneath the Shipwreck #7 (i.e., *Barge 535*) (Figure 167). This wreck is not recorded in the sidescan sonar data due to poor geometry associated with the sidescan sonar tow fish height, the river bottom, and the wreck. Multi-beam data, however, indicates that it is almost flush with the river's bottom and it measures approximately 24.4 m (80 ft) in length and 9.1 to 12.2 m (30 to 40 ft) in width (Table 16).

Based upon the available data, this wreck does not fit any of the known wrecks in the area. However, its position, i.e., the stacking of vessels (Shipwrecks #6 through 10) in the immediate vicinity, suggests that Site 16OR198 (Shipwreck #10) reflects a hull collapse resulting in mismatched dimensions. Its size and shape sug-

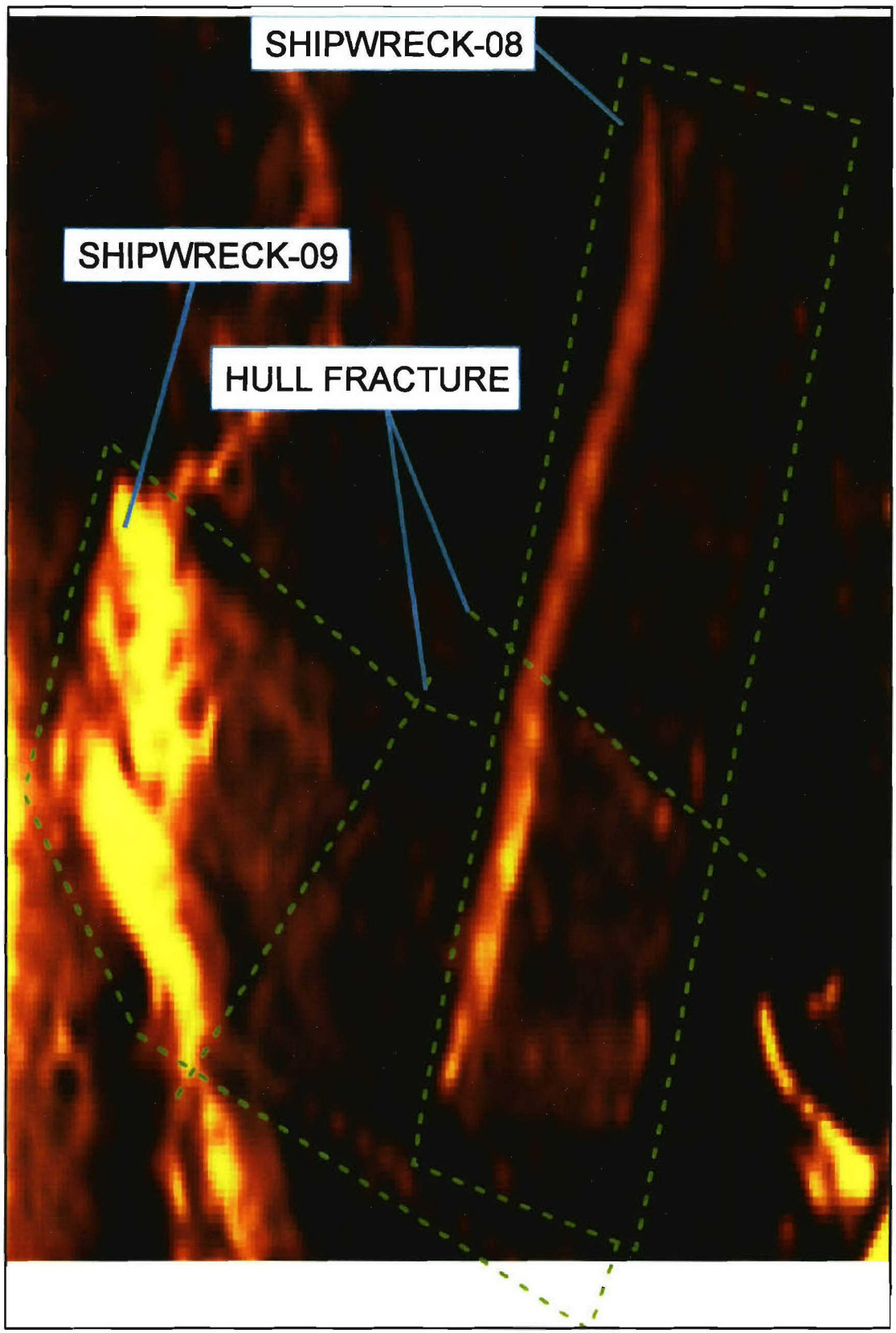


Figure 178. **Side Scan Sonar Image of Shipwrecks #8 and #9.**

gests a barge, rectangular in plan view. Further discrimination is not possible from remote sensing data, due to the palimpsest of at least four other stacked vessels and disarticulated debris. Nevertheless, a barge lacking structural integrity due to hull collapse does not possess the qualities of significance as defined by the National Register criteria. No further work is recommended for this vessel.

Site 16OR199 (Shipwreck #11; *A.M. Halliday*)

Shipwreck #11 is located in the center of the study area, just south of *Barge 535* (Shipwreck #7), at a river depth of 15.8 m (52 ft) (Figures 139 and 167). Positioned at UTM coordinates N3313717, E776479, Shipwreck #11 was identified at approximate River Mile 102.12 on the left descending bank of the Mississippi River. This wreck was not recorded during the sidescan sonar survey clearly enough for measurements or imaging; however, multi-beam data depicts a capsized catamaran hull configuration that measures 36.6 m (120 ft) in length with a total beam distance of 18.3 (60 ft) (Figure 179; Table 16). Based upon the multi-beam image and historical data, this vessel has been identified as the ferry *A.M. Halliday*.

The *A.M. Halliday* consisted of a steel vehicle ferry built in 1903 at Jeffersonville, Indiana; it was present in the City of New Orleans by 1905 (Cert. No. 2, Record of Enrollments from July 2, 1937 to March 29, 1941). The Ship Register and Enrollments of New Orleans (n.d. [ca. 1860]) indicate that J.E. Clark of the Southern Transportation Co. & Ferryboat in New Orleans owned the ferry as of July of 1908. These documents also state that upper deck of this ferry was destroyed during a hurricane on September 29, 1917, causing $1,000.00 damage. The earliest recovered enrollment document for the Algiers Public Service Company, which owned the ferry, was issued at the port of New Orleans on August 10, 1939, Certificate No. 2, and official number 107836. The master at the time was Sidney J. Fitch; the crew and master amounted to 10 men.

The *A. M. Halliday* was characterized as a coal burning "steam catamaran," with 450 horsepower (Figure 180). This single decked vessel had a plain head, a round stern, and no masts. It had a single smokestack situated behind the pilothouse, giving the pilot an unobstructed view of the river and landing. Vehicles boarded across the side of the ferry while it was docked parallel to the pier, and there was a passenger enclosure and promenade deck just below the pilothouse. The total registered length of this craft was 36.9 m (121 ft), with a beam of 18 m (59 ft) and a depth of 2.3 m (7.7 ft). Its capacity under the tonnage deck was 207.52 tons. It had no deductions or registered capacity for deck enclosures; therefore, its gross and net tonnage figures were documented as 207 tons (Cert. No. 2, Record of Enrollments from July 2, 1937 to March 29, 1941).

Additional enrollment records indicated that Sidney J. Fitch handed over the *A.M. Halliday* to a new master, Clovis J. Le Blauc, on October 18, 1939. A year later, on August 6, 1940, Paul S. Kopp replaced Le Blauc; however, he moved on when Le Blauc returned to the post on July 31, 1941 (Record of Endorsements of Change of Master July 1933 to December 1941:61, 75, 99). In 1955, the *A.M. Halliday* was engaged in transporting vehicles from Napoleon Avenue, New Orleans, to Marrero, Louisiana for the Napoleon Avenue Ferry Company (Corps of Engineers 1955:139). The ferry eventually sank within the project area, however, neither the date of its purchase or the date of the ferry's loss could be determined.

Site 16OR199 (Shipwreck #11) was identified as the early twentieth century, catamaran ferry *A.M. Halliday*. This investigation was unable to determine when and for what reason the ship sank, except that it clearly is shown above water in a geo-referenced air photo dated from ca. 1970 (Figure 165). The *A.M. Halliday*, along with the *Algiers*, were two catamaran ferries that traveled from Canal Street to Algiers during the early twentieth century. With the development of the automobile, structural changes or modifications were not required for the *A. M. Halliday* to convert it into a car and passenger ferry, since the automobile was similar in weight to a cart pulled by a team of horses. Therefore, few modifications have been made to the vessel structure prior to its sinking.

Under the theme of transportation in *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983) the *A.M. Halliday* became a bridge for people and ideas between the

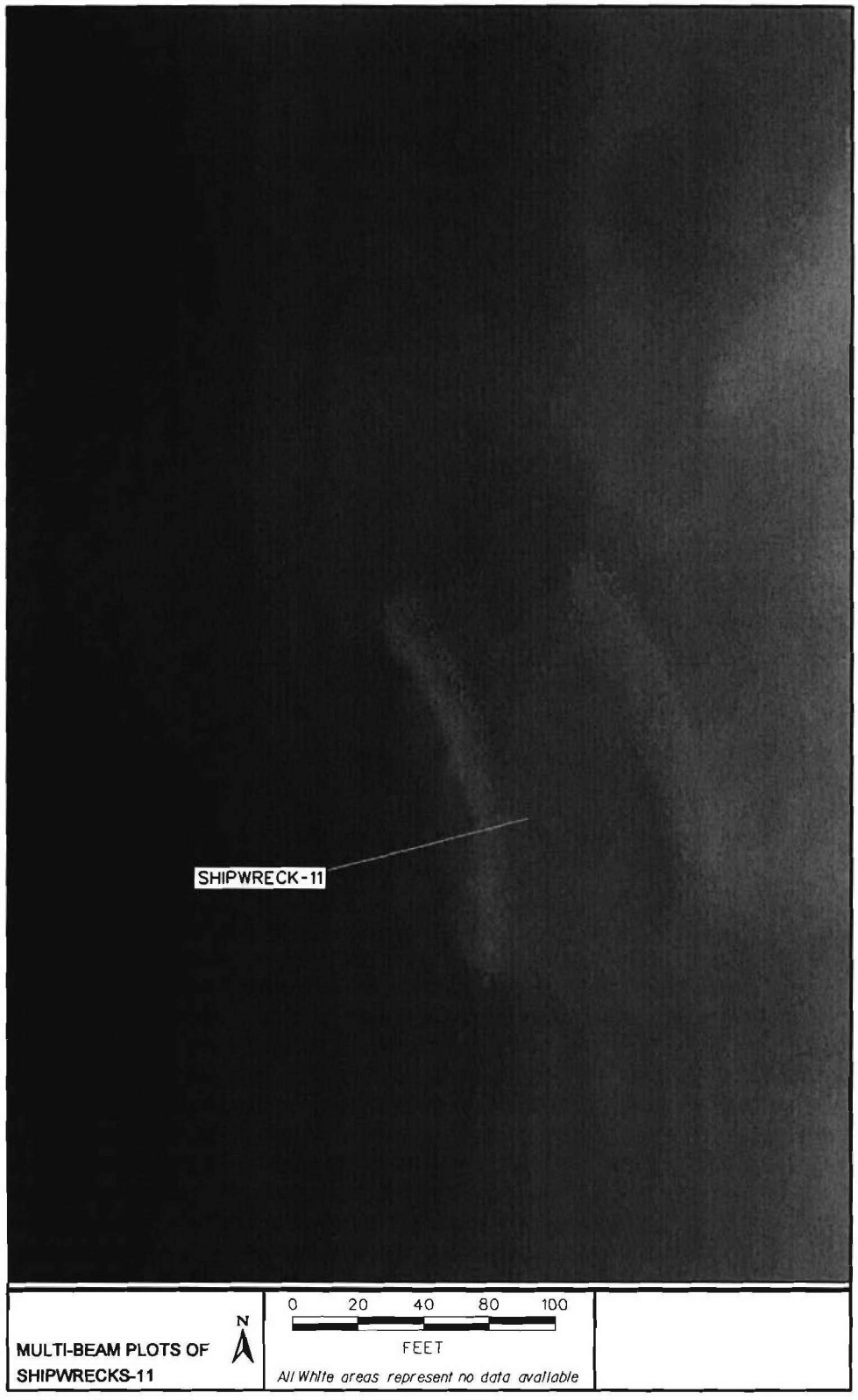


Figure 179. Multi-Beam Grid Point Image of Shipwreck # 11.

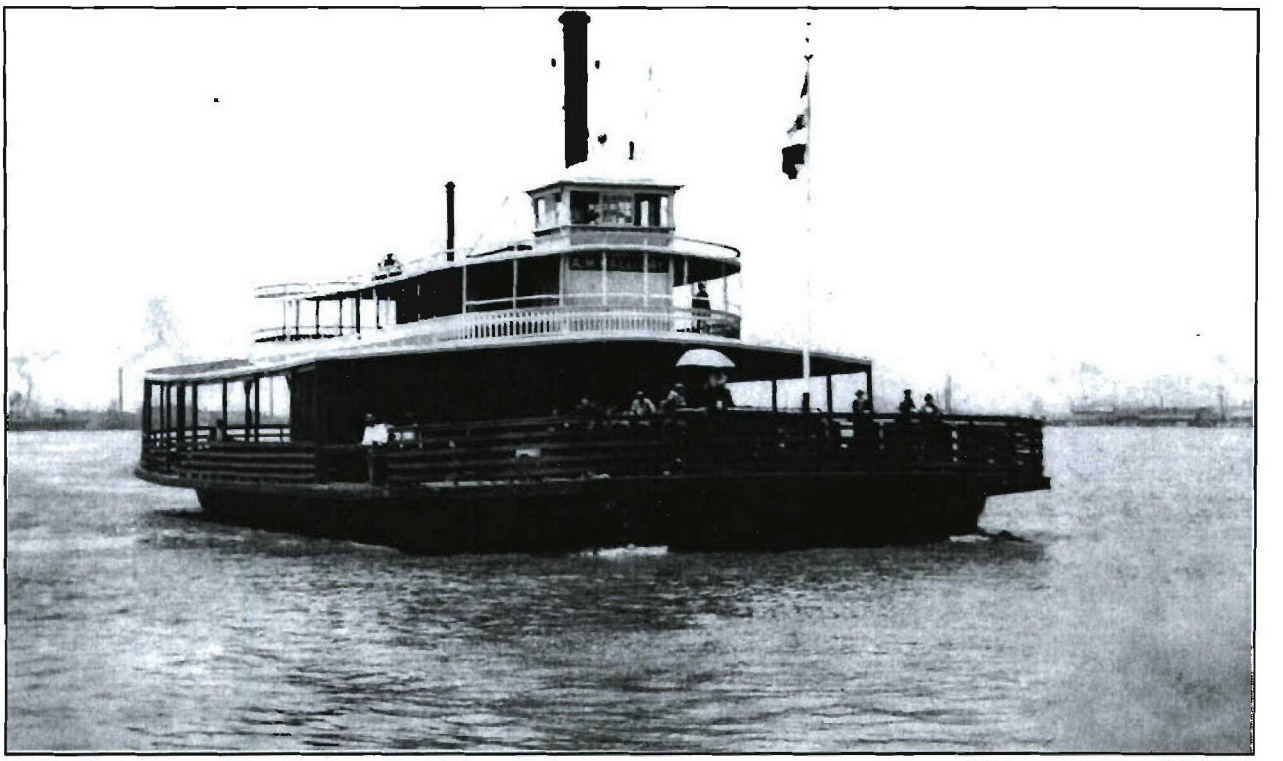


Figure 180. **The coal burning "steam catamarin" ferry *A. M. Halliday* (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

communities of Carrollton, and Westwego during the early twentieth century. For example, the improvement of land and water based transportation systems provided the opportunity to live farther away from the workplace and commercial districts. Ferries, such as the *A.M. Halliday* and the *Algiers,* became the anchor between residential and commercial communities throughout the city of New Orleans. Thus, the work of the *A.M. Halliday* was directly associated with the growth of Carrollton and Westwego.

Furthermore, the *A. M. Halliday* is one of a number of catamaran ferries that operated in New Orleans at the turn of the twentieth century. Catamaran ferries at the turn of the century and during the first half of the century, however, appear to have been a relatively rare phenomenon, possibly localized in the lower Mississippi River. Finally, study of the *A.M. Halliday* has the potential to provide valuable information concerning construction, use, or activity associated with catamaran ferries, which have not been well documented. Therefore, the *A. M. Halliday* has the potential to yield important data that would further our understanding both of this type of craft and of local and regional history. However, the remote sensing data indicate that this vessel is badly damaged and eroded, and that it is lying upside down on the river bottom. Because of the extent of the damage, its integrity is marginal. Nevertheless, its potential significance under Criteria A and D, given the limitations of the data that can be brought to bear at this time, argue that this vessel should be considered potentially eligible for listing on the National Register. Additional historical background research regarding the *A.M. Halliday* and catamaran ferries could determine and explicate its rightful place in the development of riverine transportation for New Orleans.

Site 16OR200 (Shipwreck #12; Unknown Vessel)

Shipwreck #12 was identified adjacent to the left descending bank of the Mississippi River, at approximate River Mile 102.03. The vessel is located at UTM coordinates N3313572, E776489 at river depths ranging from 13.4 to 18 m (44 to 59 ft) (Figure 139). Shipwreck #12 is an isolated wreck located near the southern end of the proposed project area (Figure 181). Based on the collected multi-beam data, the recorded dimensions of this wreck measure approximately 61 m (200 ft) in length, with a beam of 12.2 m (40 ft) (Table 16). The sidescan data, however, indicated that the dimension of Shipwreck #12 measured approximately 60.3 to 64 m (198 to 210 ft) in length, with a beam of 10.7 to 12.2 m (35 to 40 ft). This data set also indicated collapse of the vessel's hull (Figure 182).

No recorded vessels lost in the study area match precisely the recorded measurements of Shipwreck #12. However, its measurements closely match those of the *E.N.B. Barge 535*, described previously. Furthermore, its sheer size and shape, i.e., its rectangularity, argue strongly that this vessel comprises another lost barge, the most common vessel type along this stretch of river. A common barge with a collapsed hull does not possess the qualities of significance as defined by the National Register of Historic Places criteria of evaluation.

Site 16OR201 (Shipwreck #13; *Mary B*)

Shipwreck #13 is located in the southernmost portion of the study area, along with six other vessels (i.e., Shipwrecks 14 through 19) (Figures 139 and 181). Positioned at approximate River Mile 101.98 on the left descending bank of the Mississippi River, Shipwreck #13 was identified at UTM coordinates N3313506, E776492. This wreck has measurements from both sidescan and multi-beam data. It measures approximately 36.6 m (120 ft) in length and 7.3 m (24 ft) in width; it is situated at a river depth that ranges from 11.9 to 17.7 m (39 to 58 ft). The sidescan sonar records indicate that the upper portions of the hull are intact (Figure 183). Analysis of the remote sensing data, historic documentation, and oral history suggested that this vessel represents the remains of a tug called the *Mary B.*

The tug *Mary B.* was built of riveted charcoal iron at West San Francisco, California, in ca. 1903 (Bachrach & Co, Inc., 1963). Originally built as an ocean-going hawser tug, the *Mary B.* was converted to a harbor tug around 1946 when the New Orleans Coal and Bisso Towboat Company purchased it from the United States government; this was the second vessel of that name operated by the New Orleans Coal and Bisso Towboat Company.

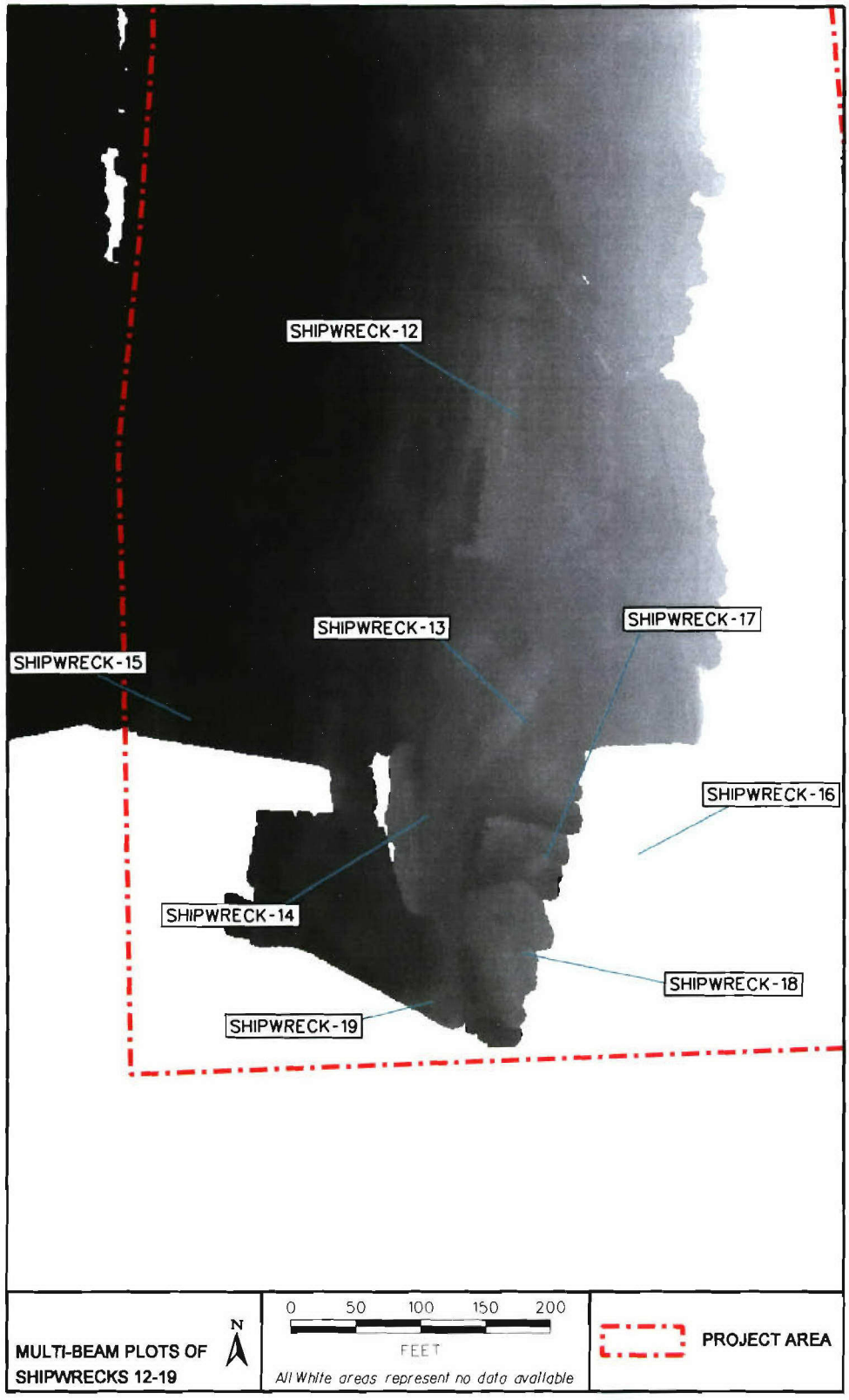


Figure 181. **Multi-Beam Grid Plot Image of Shipwrecks 12 – 19 in the Southern Portion of the Study Area.**

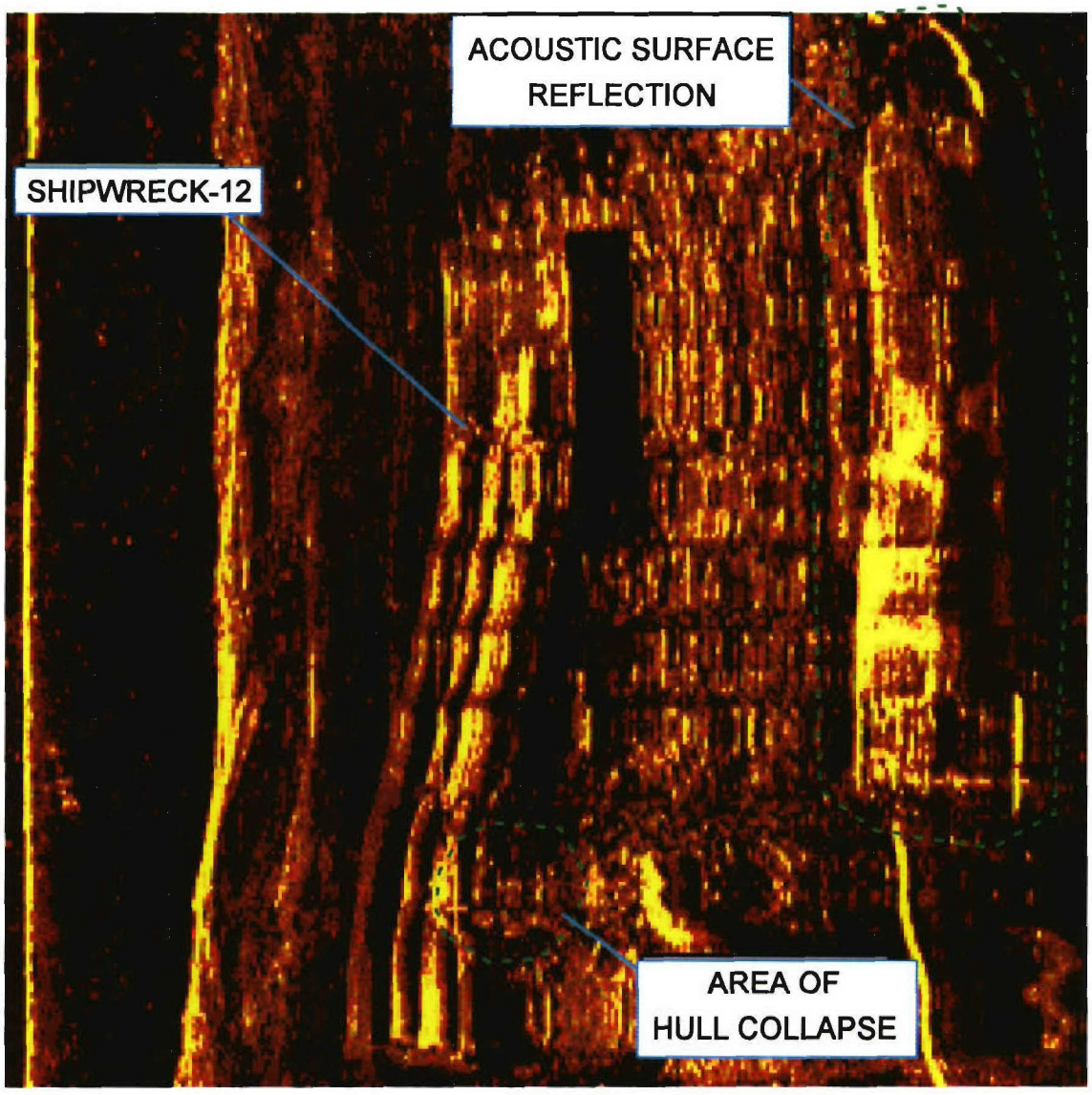


Figure 182. **Side Scan Sonar Image of Shipwreck #12.**

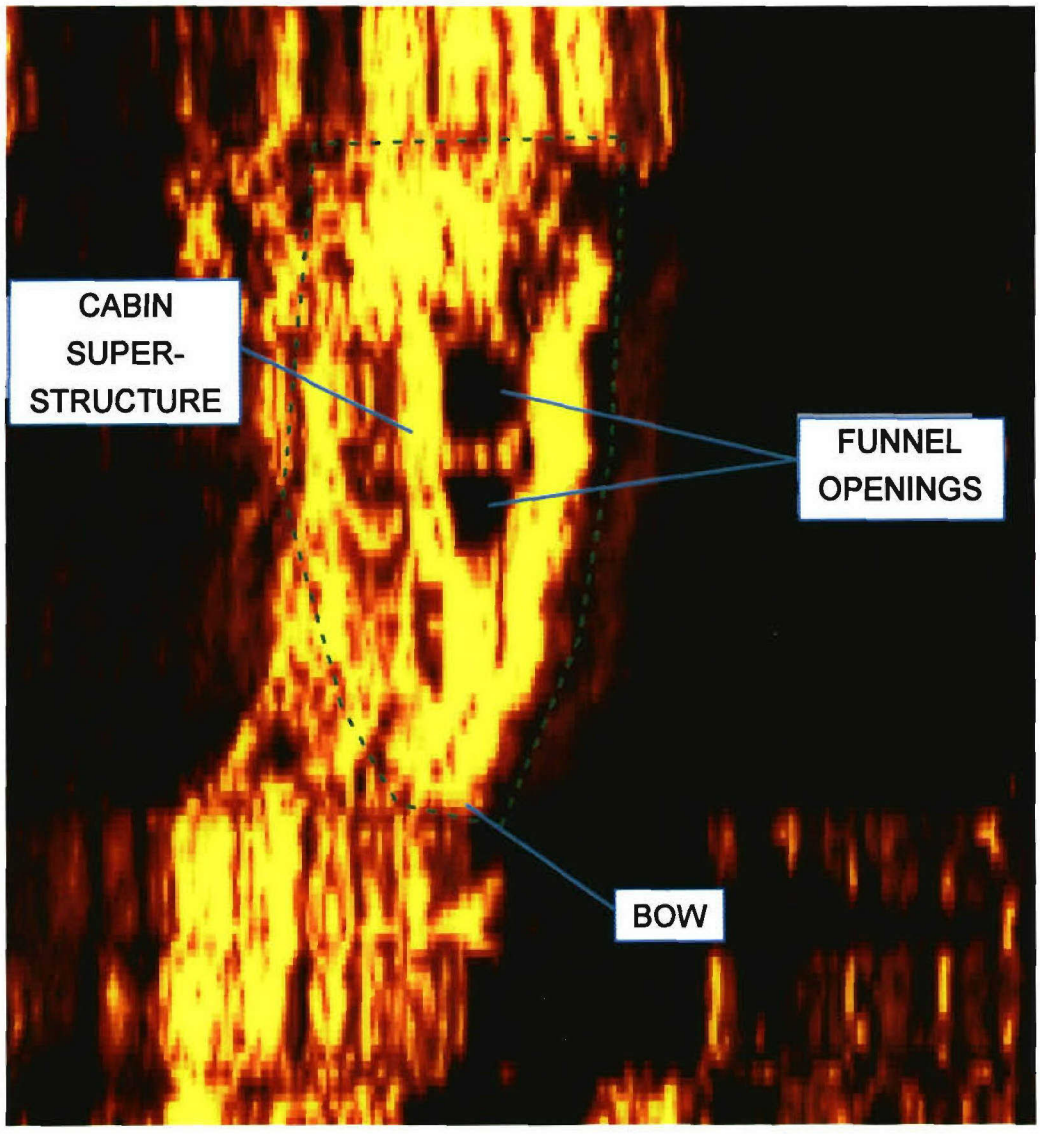


Figure 183. **Side Scan Sonar Image of Shipwreck #13 Showing Vessel Superstructure and Funnel Openings.**

When in service and working a 12-hour day, the crew consisted of five men; however, when working a 24-hour day the crew compliment was increased to nine men. The *Mary B.* was not pilothouse controlled; thus, it required an engineer acting on commands received from the pilothouse. This vessel had a single screw propeller; the main propulsion consisted of one triple expansion, steam reciprocating engine of 1,200 HP. It had two water tube surplus Navy boilers that likely were salvaged from a World War I frigate-type vessel. Each of the boilers had one furnace with two fire doors. The fuel capacity was 900 barrels, or approximately 50,000 gallons of fuel oil; the daily fuel consumption rate at full rpms was estimated at 75 barrels, or approximately 4,125 gallons (Bachrach & Co, Inc., 1963).

The earliest reference to the *Mary B.* in the Record of Marine Documents Deposited January 1915 to July 1932, indicates that the *Mary B.* was licensed in New Orleans on April 29, 1920; it was issued Certificate No. 103, but no corresponding enrollment was located (Record of Marine Documents Deposited January 1915 to July 1932:18; Record of Enrollments from July 1, 1915 to June 30, 1922. RG36-N22). No record for this vessel was found in the Record of Endorsements of Change of Master 1933-1941, suggesting that it continued with the same master from the time of its enrollment in 1920 to the end of 1941.

A Marine Survey report prepared by Bachrach & Co., Inc. and dated July 13, 1963, for the tug *Mary B.* contains a great deal of information (Bachrach & Co, Inc., 1963). The official number of the *Mary B.* was #200465, she weighed 269 gross tons and underwent two episodes of re-powering, starting with coal-fired steam and switching to oil-fired boilers as reported in a survey of her hull in 1963 (Bachrach & Co, Inc., 1963). It had a flush deck, module bow, overhang stern, steel lower deckhouse, and a wooden pilothouse (Figure 184). The registered dimensions documented a length of 37 m (121.5 ft), a breadth of 7.5 m (24.5 ft), and a depth of 4.6 m (15 ft). The draft was measured at 3 m (10 ft) forward and 3.7 m (12 ft) aft. Finally, the freeboard aft of amidships measured approximately 91.4 cm (36 in) (Bachrach & Co, Inc., 1963). At the time of the marine survey in 1963, the *Mary B.* had had a good deal of the machinery and equipment removed, and it had been idle for some time.

Beginning in the early 1960s, most New Orleans tug operators had replaced similar tugs and they were selling their old and well maintained tugs for approximately $10,000.00 or less. Similarly, the United States government also had disposed of numerous similar vessels at very low prices (Bachrach & Co, Inc., 1963). Therefore, since there was a negligible demand for such a vessel at the time, and given the type and condition of the *Mary B.* in 1963, the vessel was valued at $5,000.00 for scrap only. The re-sale demand for this vessel also was reduced by reason of its age, size, horsepower, deep draft, manning requirements of a heavy nature, high operating costs, extent of repairs that would have been required to place it in usable condition, high fuel consumption with resultant high cost of operations, and the expensive insurance premiums based on the wide latitude between present-day low market value and high present-day replacement value and limitations of operating service (Figure 185).

Thus, Site 16OR201 (Shipwreck #13) was identified as a twentieth century tug that likely represents the *Mary B.,* which was constructed ca. 1903; however, the date the vessel sank within the proposed project reach has not been established precisely, except that it was post 1963. This tug is one of a numerous class of tugboats, a number of which remain in service today to aid in the transport of cargoes and ships. It is a common vessel type (i.e., a charcoal iron tugboat) that was built in the United States during the late nineteenth and early twentieth centuries. In fact, several similar examples, albeit with modernized machinery, currently are owned and operated by E.N. Bisso and Son, Inc., within the project area (William A. Bisso, III, personal communication: October 12, 2003). It is thoroughly documented in the archival record, and therefore lacks research potential. Site 16OR201 does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional survey or historical research is recommended.

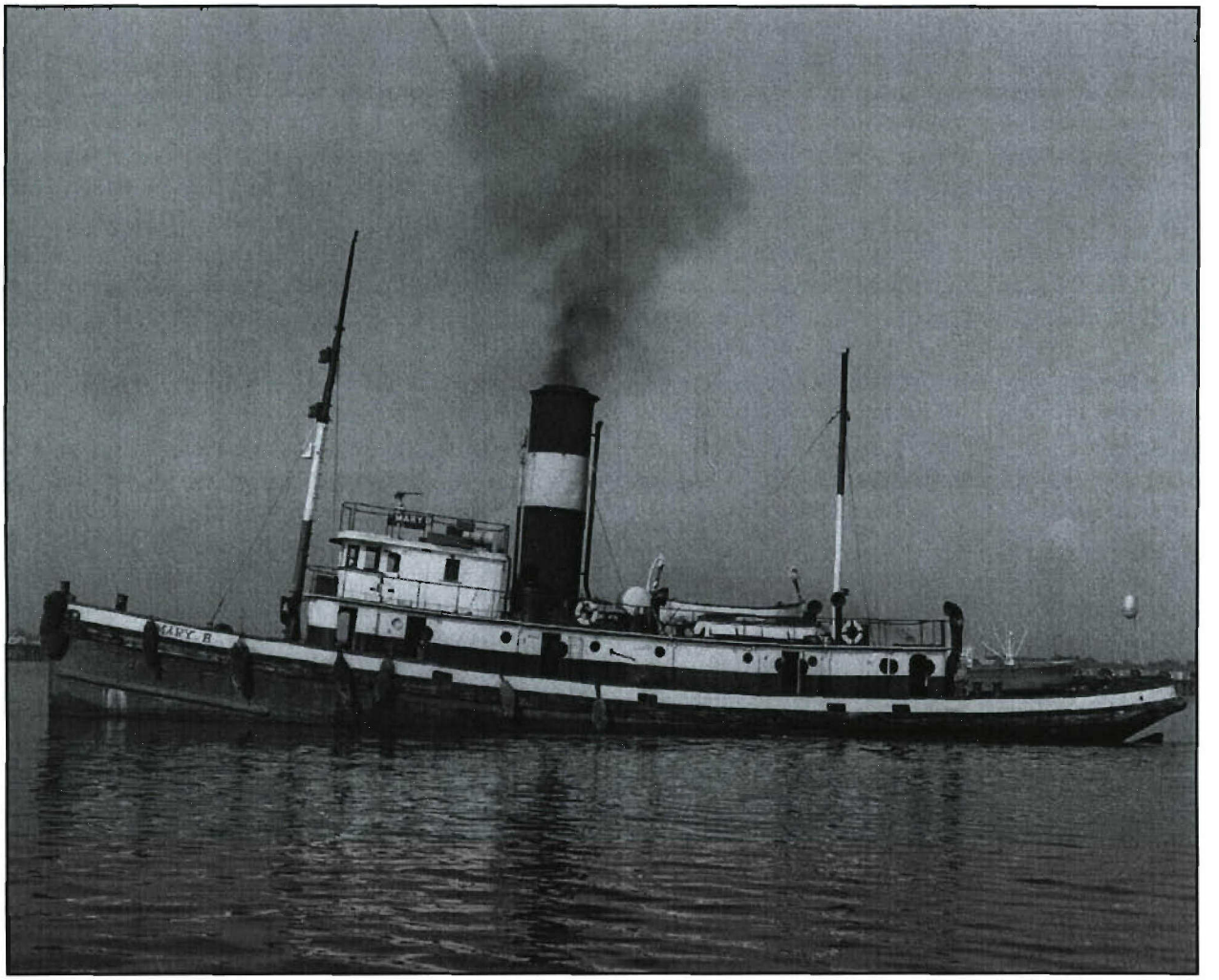


Figure 184. **Photograph of the *Mary B.* in profile displaying the characteristic tall smokestack of the steam tug (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

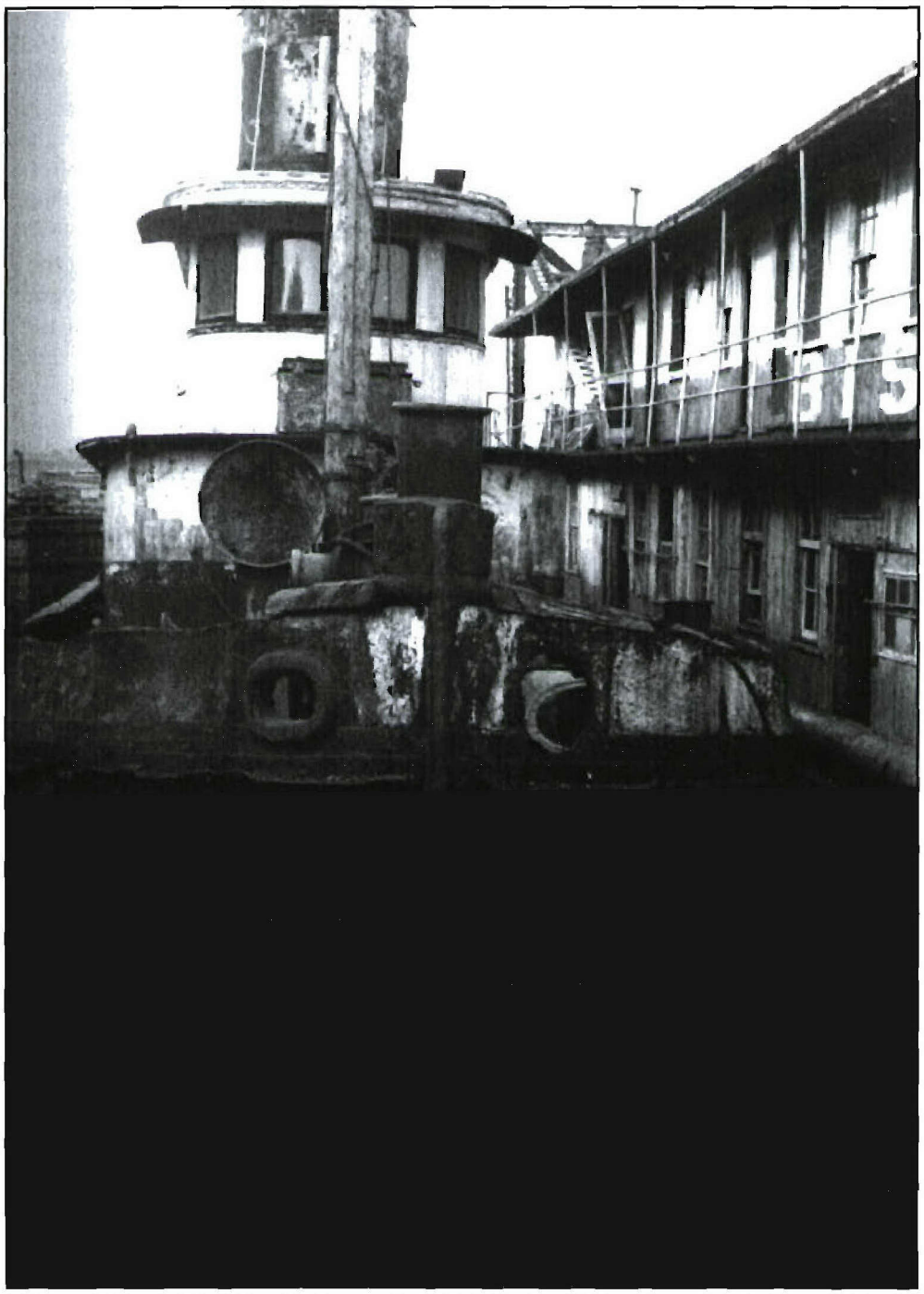


Figure 185. **The *Mary B.* close to the end of her days (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

Site 16OR202 (Shipwreck #14; *Tyler*)

Shipwreck #14 was documented at approximate River Mile 101.97 adjacent to the left descending bank of the Mississippi River (Figure 139). The vessel is situated at UTM coordinates N3313481, E776470, at river depths that range from 17 to 18.6 m (56 to 61 ft). Shipwreck #14 is located amongst a cluster of shipwrecks positioned in the southern portion of the study area (Figure 181). Sidescan sonar measurements of the vessel yielded dissimilar readings due to the changing geometry associated with two different recordings of the hull on separate track lines (Figure 186). The sidescan measurements ranged from 22.6 to 33.5 m (74 to 110 ft) in length and 5.5 to 8.2 m (18 to 27 ft) in width, while multi-beam data collection yielded a measurement of 39.6 m (130 ft) in length, and a beam of 7.6 m (25 ft) (Table 16).

Based upon the multi-beam data and the overall shape of the hull in the sidescan data set, Shipwreck #14 has been associated with the *Tyler*; a stern-wheel push boat built in 1920 at Newburgh, New York. In 1921, a year after the *Tyler* was built, it was sold in Tampico, Mexico and renamed the *Topila*. W. A. Bisso, president of the New Orleans Coal and Bisso Towboat Company, purchased the vessel in 1931, and it was re-documented at that time (Record of Enrollments from September 27, 1929 to June 30, 1932:353). The vessel's July 16, 1931 enrollment papers record a measured length for the *Tyler* of 36.6 m (120 ft), and a beam of 7.6 m (24.8 ft), with a depth of 1.7 m (5.7 ft); it was issued Certificate No. 3 with the official number 167979 (Record of Enrollments from September 27, 1929 to June 30, 1932:353).

The *Tyler* was described as a coal burning steam-powered stern-wheel of 300 horsepower operated by a crew of 10 men (Figure 187). It had a single deck, no masts, and it was fitted with a square head and stern. The *Tyler's* capacity under the tonnage deck was 155.87 tons, while the capacity of the enclosures amounted to 49.35 tons, yielding a gross tonnage figure of 205.22 tons. From this were deducted 35.77 tons for the crew space and 13.09 tons for the master's cabin. Total deductions added up to 48.86 tons, for a net tonnage figure of 156 tons. In addition to the cabins, the *Tyler* contained water closets, skylights, and a galley. At the time of the 1931 enrollment, it was licensed for the coasting trade for a single year (Record of Enrollments from September 27, 1929 to June 30, 1932:353).

The *Tyler* often was operated under W. A. Bisso, Jr., as master. Such was the case in 1932 when a series of photographs of the stern-wheeler push boat *Tyler* and a deck barge named the *Jewett* were taken (Figure 188). At that time, the *Tyler* was used to transport the *Jewett* and its cargo during a job in Greenwood, Mississippi. Fixed on the starboard bow of the *Jewett* was a small crane used to load and unload cargo. On board the *Jewett* also were four flatbed trucks used to collect cargo and bring it to the port (Figure 189). As seen in Figure 190, the vessel's cargo consisted of approximately 5,200 bales of cotton. Everything for the job was carried on the barge to expedite a rapid turnaround.

While in Nashville in September of 1934, Bisso turned the *Tyler* over to a new master, Hugh L. Crouse; however, by August of the following year, Bisso was once again the captain. On August 15, 1936, the *Tyler* was re-enrolled in New Orleans and issued Certificate No. 8. The documented tonnage and dimensions did not change from the previous enrollment in 1931; however, in the intervening period it had been converted to an oil burner (Cert. No. 8, Record of Enrollments from July 1, 1932 to June 30, 1937). W. A. Bisso, Jr. remained in command of the *Tyler* for two years before again turning it over to a new master, Stanislaus Le Blanc, in August of 1937 (Record of Endorsements of Change of Master July 1933 to December 1941: 8, 13, 31).

Stanislaus Le Blanc's tenure as master of the *Tyler* apparently ended in 1940 when the vessel was re-enrolled on June 19 and issued Certificate No. 94 with a license to operate in the coastal trade for another year (Cert. No. 94, Record of Enrollments from July 2, 1937 to March 29, 1941). The new master, C. G. Barker, was replaced shortly thereafter by Oliver H. Trosclair on October 7, 1940. On April 22, 1941, C. G. Barker, the man who had preceded him in the job, replaced Trosclair. W. A. Bisso, Jr. was back as master on June 16, 1941 (Record of Endorsements of Change of Master July 1933 to December 1941: 79, 92, 96). The *Tyler* still was in the towing business as late as 1952 for

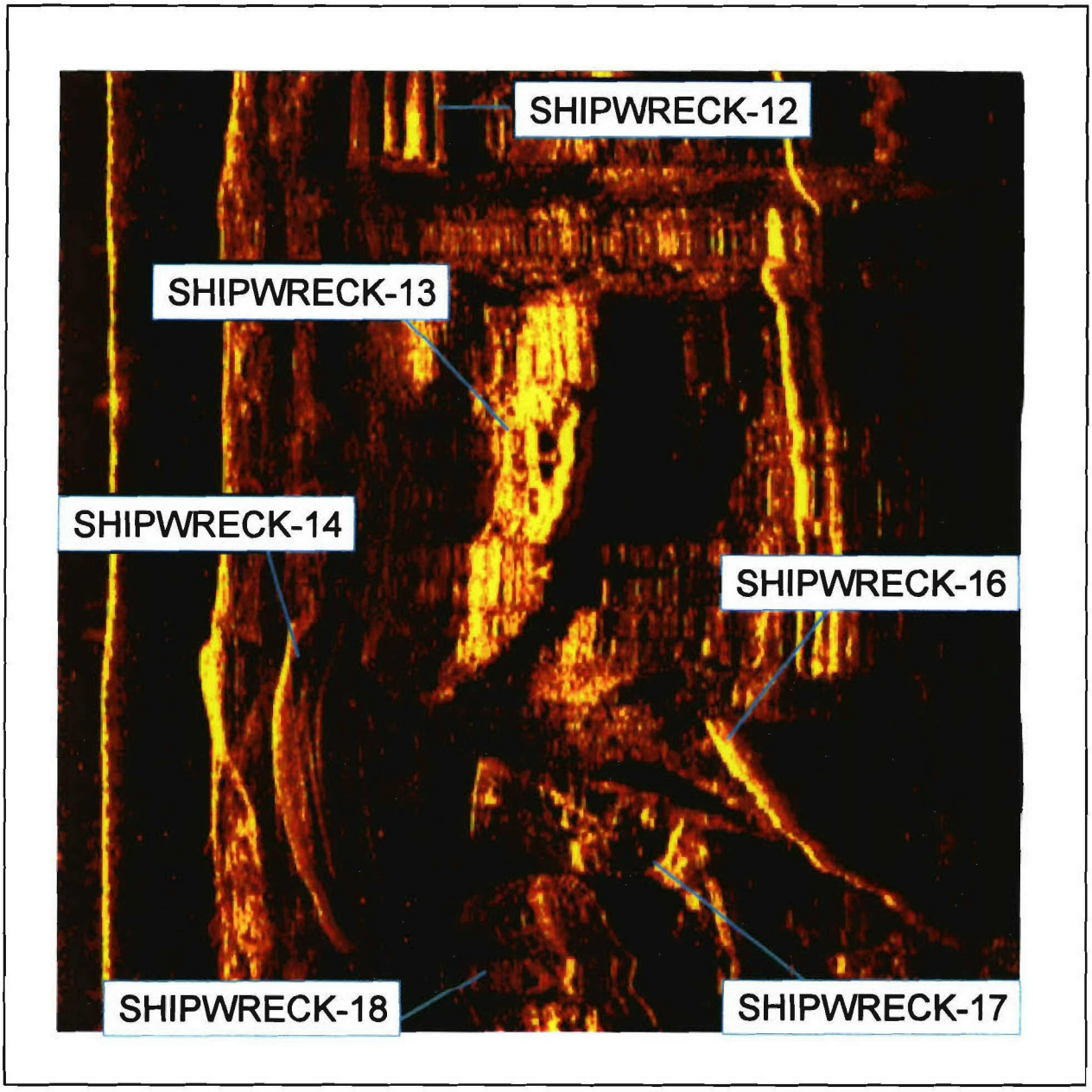


Figure 186. **Side Scan Sonar Image of Shipwrecks #13, #14, #16 - #18.**

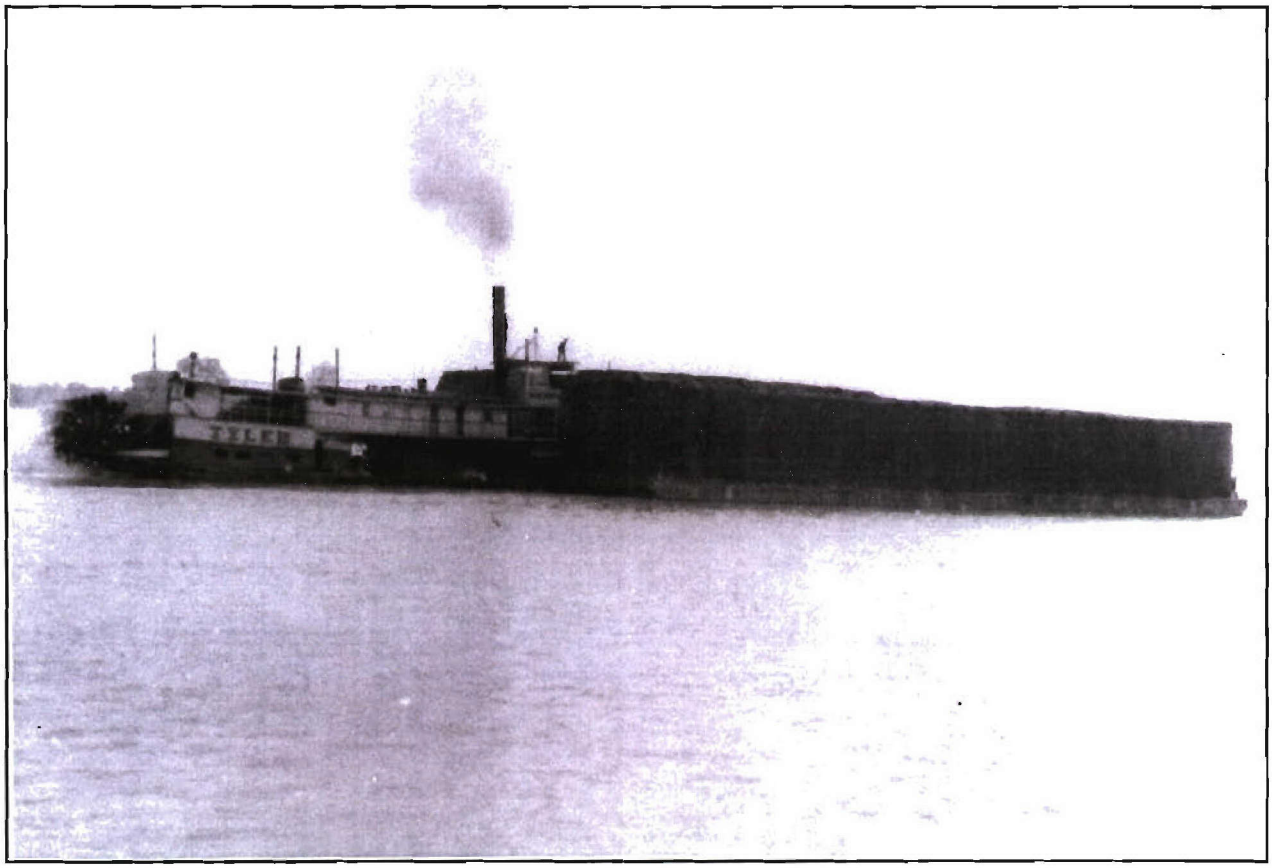


Figure 187. **Photograph of the *Tyler* pushing two barges probably loaded with cotton. The two barges are attached to either side of the *Tyler's* bow. A man, possibly a lookout, stands on top of the pilothouse (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

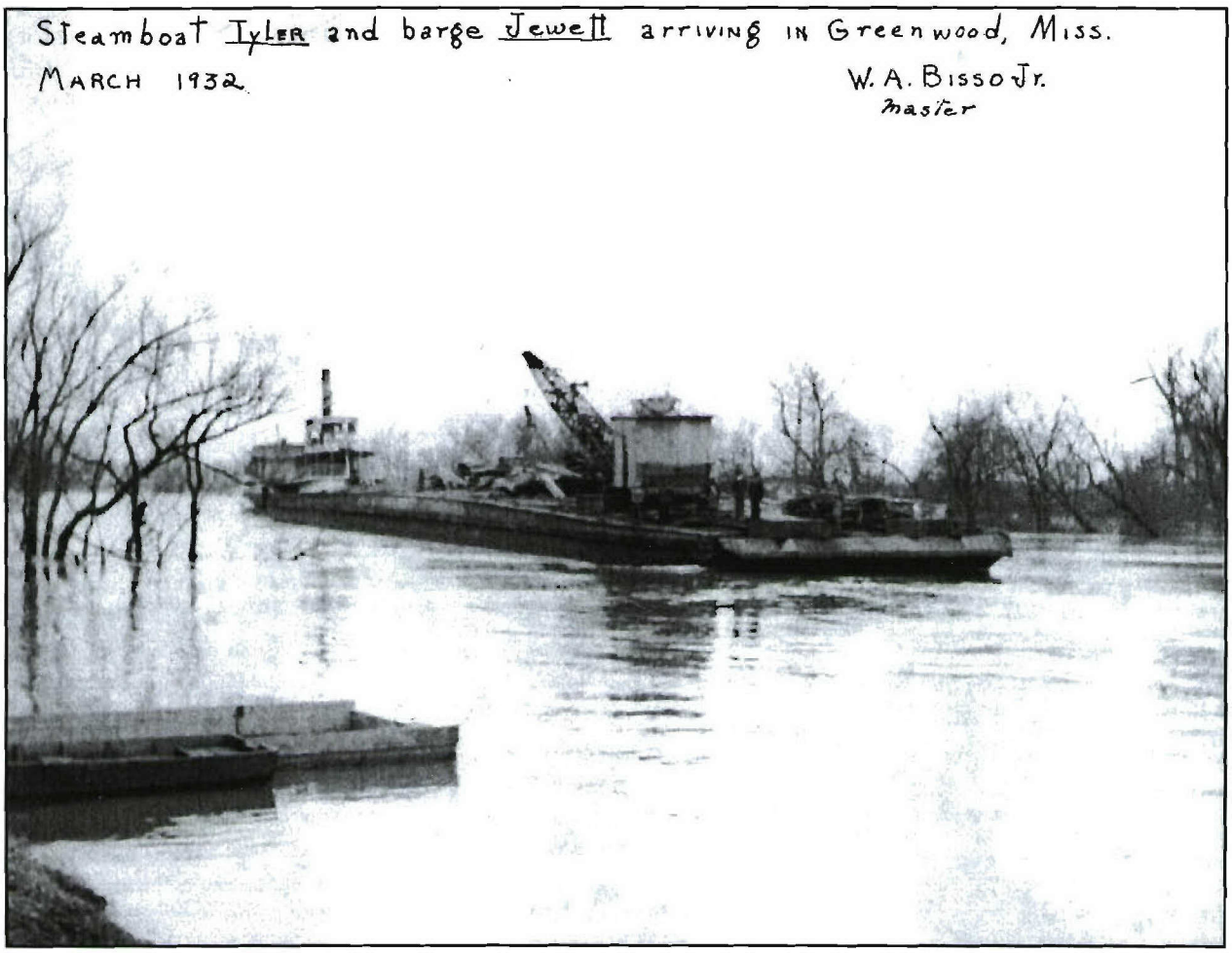


Figure 188. **Photograph showing the arrival of the *Tyler* and her barge in Greenwood, Mississippi in 1932 (Photo courtesy William A. Bisso, III Historic Photograph Collection).**



Figure 189. **Photograph showing the deck cargo of the barge *Jewett*. This was some four flatbed trucks used to collect cargo and bring it to the port (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

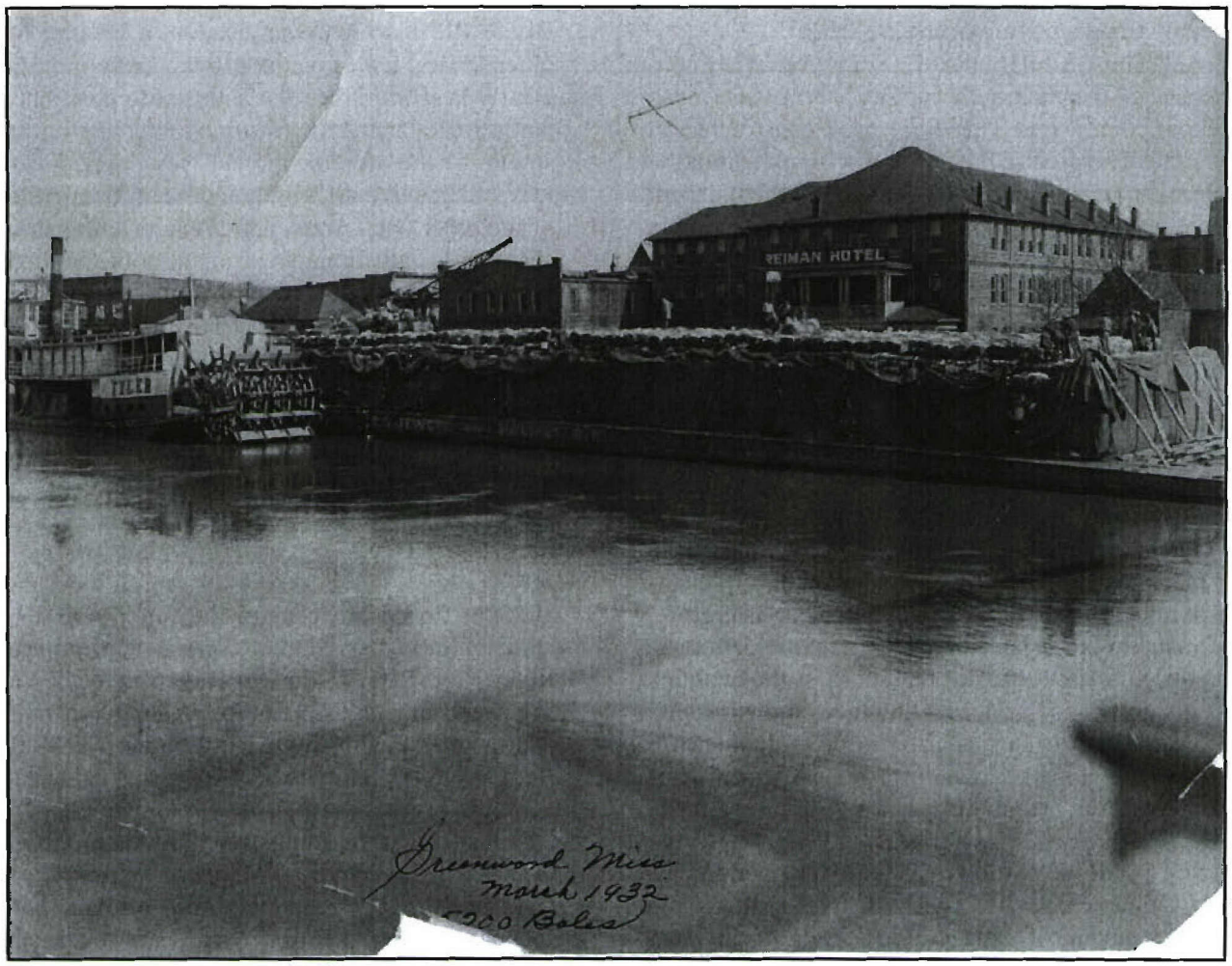


Figure 190. **Photo of the loaded cargo that consisted of some 5200 bales of cotton. Note the canvas covering used to protect the cargo from water. This is the same arrangement as shown in the previous photograph of the two barges being pushed by the *Tyler* (Photo courtesy William A. Bisso, III Historic Photograph Collection).**

the New Orleans Coal and Bisso Towboat Company (Corps of Engineers 1952:126).

Thus, Site 16OR202 (Shipwreck #14) consists of the twentieth century stern-wheel push boat, the *Tyler*. The *Tyler* was constructed in 1920. The precise date the vessel sank within the project reach has not been determined except that it postdates 1952. The *Tyler* is one example of numerous push boats that aided the transport of cargoes, barges, and tows on the Mississippi River. There is no evidence that she participated in any major historical events or that it was associated with any person of historical significance. It is a common vessel type (i.e., a stern-wheel push boat) that was built on the western rivers during the late nineteenth and early twentieth centuries. Though the *Tyler* is an example of such a craft, there were many of them, and the machinery that ran them had become fairly standardized. It also is well documented. Therefore, this shipwreck lacks research potential. As a result, Site 16OR202 does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional survey or historical research is recommended.

Site 16OR203 (Shipwreck #15; Unnamed Ferry)

Shipwreck #15 was identified along the outer margin of the southern portion of the Area of Potential Effect (Figures 139 and 181). Lying at river depths of 20.4 to 26.5 m (67 to 87 ft), this vessel is positioned at approximate River Mile 101.98 on the left descending bank of the Mississippi River, at UTM coordinates N3313491, E776418. The dimensions taken from the sidescan sonar recording of this shipwreck measured 30.5 m (100 ft) in length with a beam of 11.6 m (38 ft); most of it was situated outside of the multi-beam coverage (Figure 191; Table 16). Based upon these measurements and conversations with William A. Bisso, III (personal communication: October 13, 2003), this vessel appears to represent the remains of a landing ferry that was reported lost in the study area.

An aerial photograph taken in the 1970s indicates that the unnamed landing ferry measured approximately 33 m (108 ft) in length, with a beam of approximately 11.6 m (38 ft) (Figure 165). Its dimensions are only slightly larger than those calculated for Shipwreck #15 from the remote sensing data. According to William A. Bisso, III, this ferry was used as a landing for other ferries. It was moored to the shoreline, and clearly is seen in the 1970s air photo positioned landward of the *A.M. Halliday*, and just downstream of the aforementioned New York Ferry. It is smaller in both length and beam than either of the other two ferries, and it is conventional in shape and undistinguished in its configuration. Indeed, it lacks any noteworthy attributes indicative of National Register of Historic Places eligibility. Its lines are regular, its draft clearly was shallow, and its deck was largely uncovered, consistent with its use as a mooring or landing platform. No further work is recommended for this vessel.

Site 16OR204 (Shipwreck #16; Unknown Vessel)

Positioned adjacent to the left descending bank of the Mississippi River, at approximate River Mile 101.97, Shipwreck #16 is located at UTM coordinates N3313476, E776502, at river depths that range from 11 to 14.6 m (36 to 48 ft) (Figure 139). Shipwreck #16 also is located amongst a grouping of several shipwrecks that are clustered at the southern end of the proposed project area (Figure 181). This shipwreck is situated partially beyond the limits of the remote sensing survey; therefore, sidescan sonar and multi-beam bathymetry data are incomplete. In fact, this vessel was not recorded at all during the multi-beam bathymetry survey.

However, analysis of the sidescan sonar of Shipwreck #16 yielded an estimated length of 30.5 m (100 ft) and a beam of 9.4 m (31 ft). Due to turning errors, these measurements lack precision (Figure 191; Table 16). Since this vessel is recorded only partially in the side scan data set, no definitive identification could be made as to full vessel dimensions, typology, or function. Nevertheless, its position amongst other wreckage clearly associated with the Bisso operation strongly suggests that it derives from the loss of one of the Bisso fleet. The existing measurements, though imprecise, suggest a smaller barge-like configuration. Again, this vessel appears to represent a common vessel class better preserved in the contemporary inventory, and lacking in substantive research potential. No further work is recommended for this vessel.

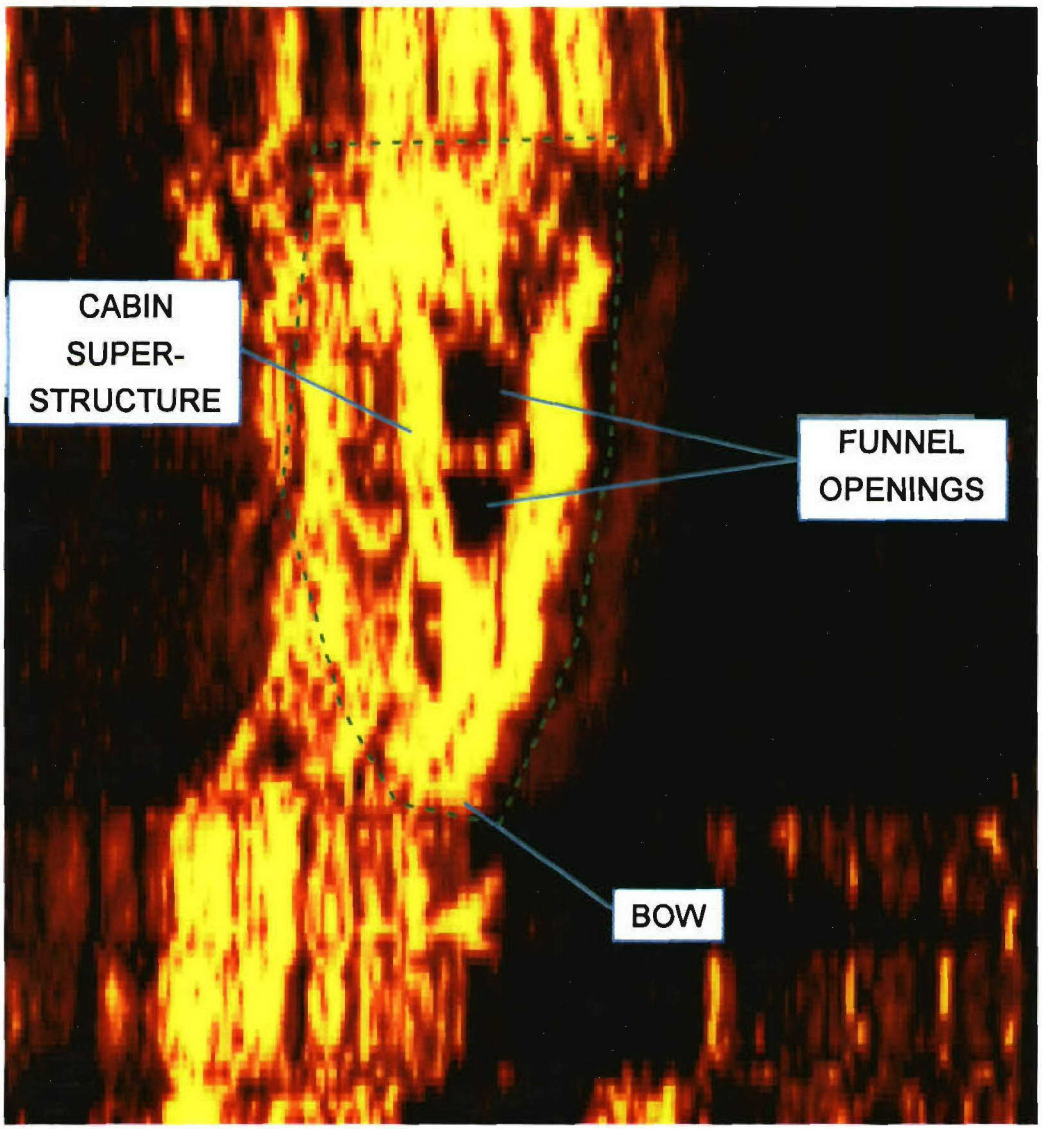


Figure 191. **Side Scan Sonar Image of Shipwreck # 15.**

Site 16OR205 (Shipwreck #17; Unknown Vessel)

Shipwreck #17 also is positioned adjacent to the left descending bank of the Mississippi River, at approximate River Mile 101.97. Located at UTM coordinates N3313479, E776520, Shipwreck #17 rests at depths ranging from 13.7 to 15.5 m (45 to 51 ft) (Figure 139). It is located amongst a grouping of several shipwrecks situated in the southern end of the project area. This wreck also is located partially beyond the limits of the remote sensing survey; therefore, sidescan sonar and multi-beam bathymetry data are incomplete.

Analysis of the collected sidescan sonar data reveals that Shipwreck #17 also represents a barge-like vessel positioned in close proximity to several other wrecks (Figure 181 and 186). This data set indicates collapse of portions of the vessel's deck, and it depicts a scatter of debris lying on the deck. The recorded dimensions of Shipwreck #17 measure approximately 18.3 to 30.5 m (60 to 100 ft) in length, with a beam of 7.6 to 9.1 m (25 to 30 ft) (Table 16); however, the total length is masked by several vessels nested next to and possibly over its deck. This wreck was recorded only partially during the multi-beam bathymetry survey.

Due to the proximity of the other vessels and the poor tow fish geometry, no complete measurements of Shipwreck #17 could be obtained; this precluded assignation to a recorded vessel loss. However, the remote sensing data clearly show that this barge has suffered significant damage, and lost its integrity. Therefore, Shipwreck #17 does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]).

Site 16OR206 (Shipwreck #18; Unknown Vessel)

Shipwreck #18 is situated at the southernmost extent of the study area, and, due to the stacking of vessels at this locality, its shape and type could not be determined with certitude (Figures 139 and 181). This vessel is located at UTM coordinates N3313449, E776498, and it was identified at approximate River Mile 101.95 on the left descending bank of the Mississippi River. It was positioned at river depths that range from 12.2 to 17 m (40 to 56 ft). Due to low quality sidescan and multi-beam coverage in this area, full documentation of this vessel was not achieved. A partial recorded dimension of the vessel's length indicates that the wreck measured longer than 18.3 m (60 ft) in length (Figure 191). In addition, the beam measured 15.2 m (50 ft) in width (Table 16). Even if the length was twice that recorded during remote sensing, this vessel, with a beam of 15.2 m (50 ft), would comprise another barge. The ubiquity of this class of watercraft along the river, and the relative frequency of barge losses, no doubt contributes to the comparative anonymity of these wrecks when compared either to powered, manned vessels, or to special purpose barges. No further work is recommended for Shipwreck #18.

Site 16OR207 (Shipwreck #19; Unknown Vessel)

Shipwreck #19 is positioned at approximate River Mile 101.94, on the left descending bank of the Mississippi River (Figure 139). The vessel is located at UTM coordinates N3313430, E776477, at river depths that range from 14.6 to 25 m (48 to 82 ft). This vessel also is located among a cluster of shipwrecks situated in the southern portion of the proposed project area. In fact, this wreck is situated partially beyond the limits of the remote sensing survey; therefore, the collected sidescan sonar and multi-beam bathymetry data are incomplete. Analysis of the previously recorded remote sensing data indicate that Shipwreck #19 does not appear in the sidescan data, and that only a portion of the wreck was captured in the multi-beam data (Figure 181). Partial measurements taken from the sidescan data yielded a recorded length of 18.3 m (60 ft) with a beam value of approximately 15.2 m (50 ft) (Table 16).

Again, the length/breadth ratio of this vessel, even if the length is doubled to compensate for incomplete remote sensing data, would be indicative of a barge. The historicity of such barges has been discussed above. No further work is recommended for Shipwreck #19.

Background Research for Terrestrial Portion of the Proposed Project Area

In conjunction with the analysis of the remote sensing data, Phase I cultural resources survey and archeological inventory of the terrestrial portion of the proposed project area was undertaken. The development of the levee system and extension of the batture in the vicinity of the project area relate directly to the preservation or destruction of archeological deposits present within the Area of Potential Effect. As discussed in Chapter IV, the levees of the Carrollton/Greenville area in Orleans Parish were not planned, built, or maintained by the U.S. Army Corps of Engineers, New Orleans District, but rather by the Orleans Parish Levee Board, which was established in 1890. Due to caving banks, the Orleans Parish Levee Board began the development of a levee in 1891; portions of the new levee in Carrollton/Greenville Bend were placed approximately 183 m (600 ft) landward of the previously built 1853 levee, creating a wide batture (Mississippi River Commission 1883-1884). This levee setback destroyed numerous commercial and residential structures that had been situated immediately landward of the 1853 levee.

Contrary to the general practice of removing the extant levee to use for fill for the new levee structure, it appears that the 1853 levee was left in place and the ground between the levees was used as borrow (Chapter IV). Due to construction techniques employed at the time, archeological deposits along the riverside of the new levee would have been damaged extensively or destroyed, effectively removing the potential to identify the remains of any structures that existed there (Goodwin et al. 1984:34). Therefore, it was determined that intact archeological deposits dating from pre 1853 are not likely to be encountered in the Carrollton Revetment project area.

Chapter IV briefly discusses the occupation of the batture by a small community made up of employees from Bisso family businesses that sprang up at the turn of the twentieth century; the last of these dwellings was removed in the 1980s (Figure 192). These structures, and their associated walkways, were built on wooden pilings above the ground surface to protect them from seasonal floods. When they were razed, the area was bulldozed and "cleaned;" thus, it is unlikely that intact deposits from these structures will be present within the terrestrial portion of the Area of Potential Effect.

While the U.S. Army Corps of Engineers, New Orleans District had no control over the Carrollton levees, they still were responsible for bank revetment along the Mississippi River in the New Orleans harbor district. Thus, revetment work had a direct impact on the materials recovered from the batture in the Carrollton area during the current survey. During previous revetment construction, tons of artificial fill was deposited to the north of the current project area. According to the 1892 Annual Report of the Chief Engineer, over 900 tons of ships' ballast was purchased for use in the willow matt revetment just north of and adjacent to the current project area (Annual Report of the Chief of Engineers 1893:3822). Ships' ballast can contain a variety of materials (e.g., metal, stone, ceramics, glass, food remains), that when placed in a dynamic environment like the bankline of the Mississippi River can be eroded and become redeposited downstream. Materials recovered during the current survey from the shoreline of the Mississippi River likely represent redeposited ships' ballast and cannot confidently be associated with the batture dwellings located in Area D.

The river channel also has changed within the vicinity of the proposed project area. Depth soundings that appear on the historic maps of the Carrollton/Greenville Bend indicate that the channel has deepened gradually over time. For example, between 1893 and 1894, the depth of the riverbed ranged from 9 to 23 m (30 to 76 ft) in depth, while the soundings recorded between 1913 and 1921 ranged from 19 to 22 m (64 to 72 ft) in depth (Mississippi River Commission 1883, 1913-1915, and 1921). By 1998, soundings of the near shore riverbed recorded depths of over 30 m (100 ft). The deepening of the river channel is due to the development of spur dikes built upriver from the project area near Southport (Annual Report of the Chief of Engineers 1893:3316). These dikes helped direct the river flow and developed a self-scouring channel to keep the river free of obstructive sedimentation. Moreover, the flow created by the dikes could



Figure 192. This United States Army Corps on Engineers map from ca. 1955 shows batture dwellings in the vicinity of the project area (United States Army Corps of Engineers, New Orleans District, map room).

have transported materials from the previously mentioned ships' ballast fill downstream and into the proposed project area.

Scouring of the channel also affected the stability of the riverbank. Long-standing Bisso Marine, Inc., employee, Donald Samuels, who served as safety officer for the field crew, commented on the significant amount of land loss on the northern edge of the Area of Potential Effect. He indicated that within the past five years, drastic erosion has removed much of the shoreline (Donald Samuels, personal communication, August 11, 2003). In fact, the points of contact for each of the Bisso companies informed the field crew prior to fieldwork that the portion of the bankline under investigation was composed of artificial fill that was deposited to stave the erosion and to fill crevasses (Beau Bisso, personal communication, August 4, 2003; William Summers, personal communication: August 4, 2003; and Rubin Dupre, personal communication: August 4, 2003).

In addition, the current research confirmed that the portion of Audubon Park (Area A) included in the current study area once was a city dump. City departments and the general public were invited by the Audubon Park Commission to begin a landfill on the park's batture in an effort to create and raise the ground level. Between the 1930s and 1970s, the Sanitation Department dumped ash from incinerators, domestic (e.g., refrigerators and washing machines) and architectural refuse, and construction debris outside the Audubon Park levee; this dumping added over 16 ha (40 ac) of land to the batture (Figure 193) (Forman and Logsdon 1985). When the dump was closed ca. 1965 to 1975, the area was leveled mechanically and truckloads of sand were brought in to raise the height of the batture 9 m (30 ft) above sea level; the area then was landscaped and it currently is utilized for recreational activities (Forman and Logsdon 1985).

This research into the historical activities that occurred with the current project area indicates a very dynamic occupation of the study area. While city streets, residences, and commercial enterprises dating from before 1891 once were present within the Area of Potential Effect, the use of this area for borrow during the construction of the 1891 levee precludes the finding of intact cultural features from this time period. Similarly, little remains of the dwellings associated with the community that once was located on the batture ca. 1900 to 1980s. Situated on pilings and bulldozed during their removal, it is unlikely that any evidence of these structures has survived. Cutbanks, crevasses, and flooding episodes also have contributed to the changing landscape within the current project area. These erosional processes have resulted in the deposition of several feet of fill in an effort to stabilize the bank and to raise the ground surface above the Mississippi River's floodwaters.

Results of Field Investigations

The terrestrial portion of the Area of Potential Effect measured approximately 768.5 m (2,521.3 ft) in length and approximately 10 to 37 m (32.8 to 121.4 ft) in width, depending on the remaining bankline and exposed shore; i.e., the terrestrial portion of the project area encompassed a total of 1.56 ha (3.86 ac) of land. This project boundary extended from the landward edge of the Area of Potential Effect, westward onto the exposed shoreline of the Mississippi River at low tide. The purposes of the survey were to identify all cultural resources located within or immediately adjacent to the terrestrial portion of the Area of Potential Effect, and to assess their eligibility applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]).

During this Phase I investigation, the proposed project area was partitioned arbitrarily into four survey blocks to facilitate control during the survey process (Areas A through D) (Figure 3; Table 3). Each of the survey areas was investigated using systematic pedestrian survey augmented with the excavation of auger tests and/or backhoe trenches throughout the Area of Potential Effect. The following discussion describes the results of the Phase I cultural resources survey and archeological inventory of the proposed Carrollton Revetment project. It should be noted that all elevations are based on the Temporary Benchmark #1, which was placed on the Audubon Park property by the U.S. Army Corps of Engineers, New Orleans District.

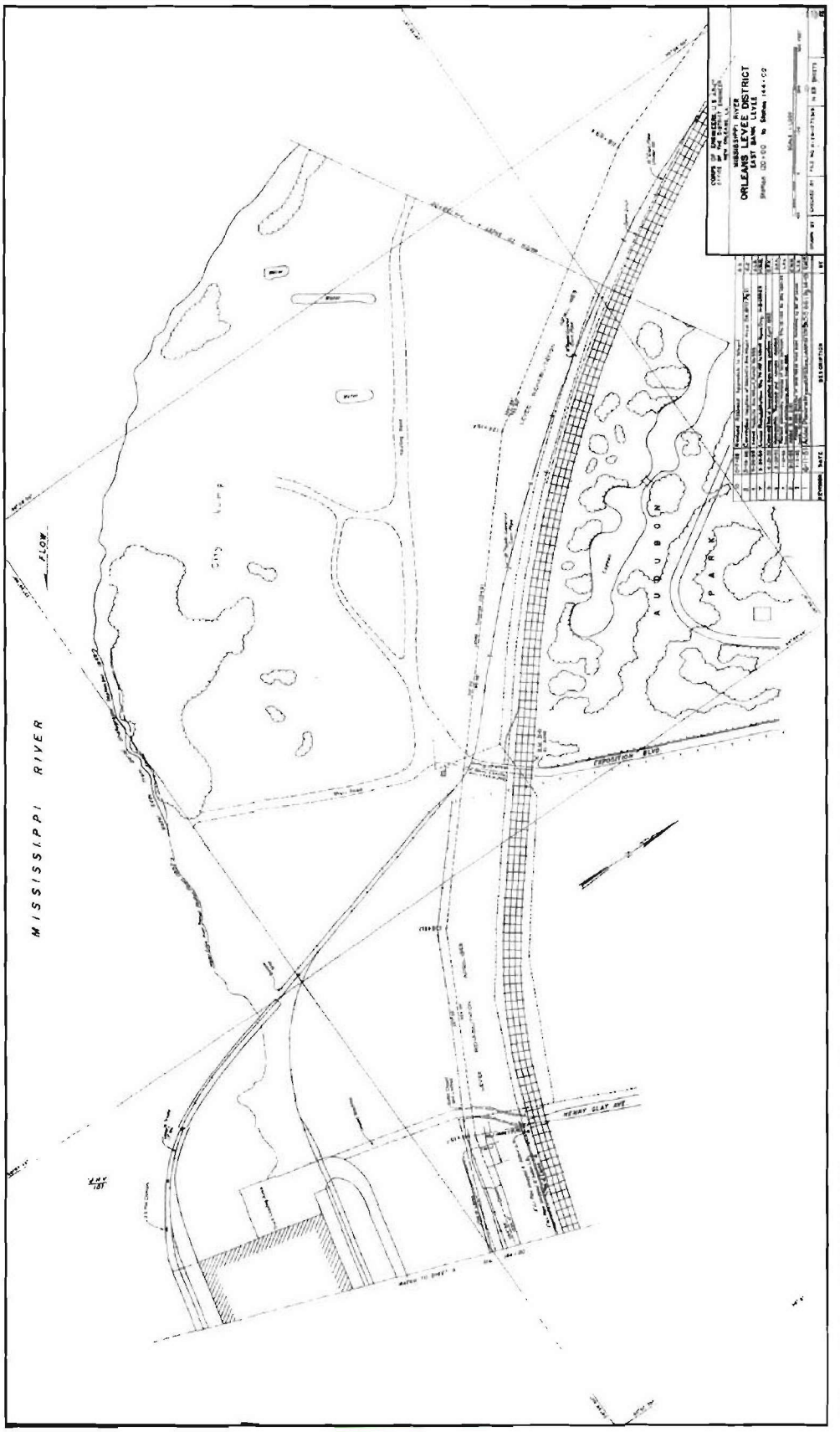


Figure 193. This United States Army Corps on Engineers map shows the Audubon Park batture area when it was the "City Dump" in the 1950s (United States Army Corps of Engineers, New Orleans District, map room).

Area A (Audubon Park)

Area A is located within a section of Audubon Park that is known locally as "The Butterfly." The project area lies within the batture of the east bank of the Mississippi River in the Greenville Bend area of New Orleans, Louisiana. This portion of the Area of Potential Effect encompassed approximately 0.18 ha (0.44 ac) of land; however, due to the nature of the landscape, only 0.14 ha (0.34 ac) of land could be examined effectively (Figure 194). That is, an area that measured, on average, 10.5 x 66 m (34.4 x 216.5 ft) in size was examined along the bankline, while an area that measured, on average, 16.25 x 66 m (53.3 x 216.5 ft) in size was examined along the shoreline (Figures 195 and 196). The remaining area was protected by riprap and debris deposited from the Mississippi River that could not be removed.

A level, manicured lawn with planted shade trees characterized the upper bank, or batture, of Area A, while sparse secondary growth and thick vines grew alone the bankline of the Mississippi River. The bankline itself was protected from erosion by the Mississippi River by riprap, while a muddy shoreline, visible at low tide, was littered with trash and debris. Figure 197 shows the topographic profile of a single linear transect that ran perpendicular to the river and that began at the landward side of the 1891 levee and extended through the project area. This profile indicates that the levee slope on the batture side is virtually nonexistent; the ground level within "The Butterfly" has been raised artificially to the same height as the 1891 levee crown (between 1.5-2.4 m [5-8 ft] above original ground surface), due to the landfill/dumping activities that took place in Audubon Park between 1930 and 1960. The difference in elevation between the batture bankline (3.76 m [12.32 ft] NGVD) and the shoreline (2.0 m [6.56 ft] NGVD) is approximately 1.76 m (5.76 ft). Extending into the river channel, this profile also depicts a rather gradual descending riverbank slope for over 50 m (164 ft) before a sharp drop off on either side of Shipwreck #18 (Site 16OR206); this implies that the vessel's remains are aiding in the erosion of the river's edge.

A total of four backhoe trenches and a single auger test were excavated within the Area of Potential Effect associated with Area A (Figure 194). Trenches 1 through 4 were positioned approximately every 15 m (49.2 ft) throughout the 10.5 x 66 m (34.4 x 216.5 ft) wide bank area. In addition to these trenches, a single auger test was excavated along the lower shoreline of the Mississippi River to determine the depth of intact soil deposits within the Area of Potential Effect.

Backhoe Trenching

Visual reconnaissance of the project area noted the presence of a large buried cable that spans the Mississippi River and crosses through the northern half of Area A. In order to avoid any impacts to this utility, subsurface testing of the project parcel took the placement of this cable into account. Thus, four planned backhoe trenches were positioned within an area noted to contain trash and structural debris that dated from the early twentieth century, i.e., from a time when the area was used as the city dump. Trench excavation confirmed the historical research.

Trench 1

Trench 1 measured 2 x 2.8 m (6.6 x 9.2 ft) in size; it was situated approximately 8 m (26.3 ft) east of the bankline and oriented in a north-south manner. It was excavated to a maximum depth of 100 cmbs (39.4 inbs), and it exhibited a single stratum in profile (Figure 198). Stratum I was characterized as a deposit of very dark grayish brown (10YR 3/2) silty clay mottled with dark grayish brown (10YR 4/2) silty clay and dark yellowish brown (10YR 4/6) silty clay; this soil horizon represented a fill deposit. At 100 cmbs (39.4 inbs), a large piece of concrete was encountered and the excavation of the trench was terminated. A large quantity of material was noted during the excavation of Trench 1; however, only 7 artifacts were collected from Stratum I (i.e., from 40 to 50 cmbs [15.7 to 19.7 inbs]).

The recovered artifacts consisted of a single yellow-glazed tile sherd, 1 whiteware sherd (post 1820), 2 large pieces of white-glazed porcelain (these possibly represent fragments of a toilet), 1 clear glass shard, 1 amber glass shard, and a metal washer (Table 18). Noted within the trench fill, but not collected, were fragments of brick, plastic, metal pipes, porcelain pipes, shell, tile, and concrete along with several unidentifi-

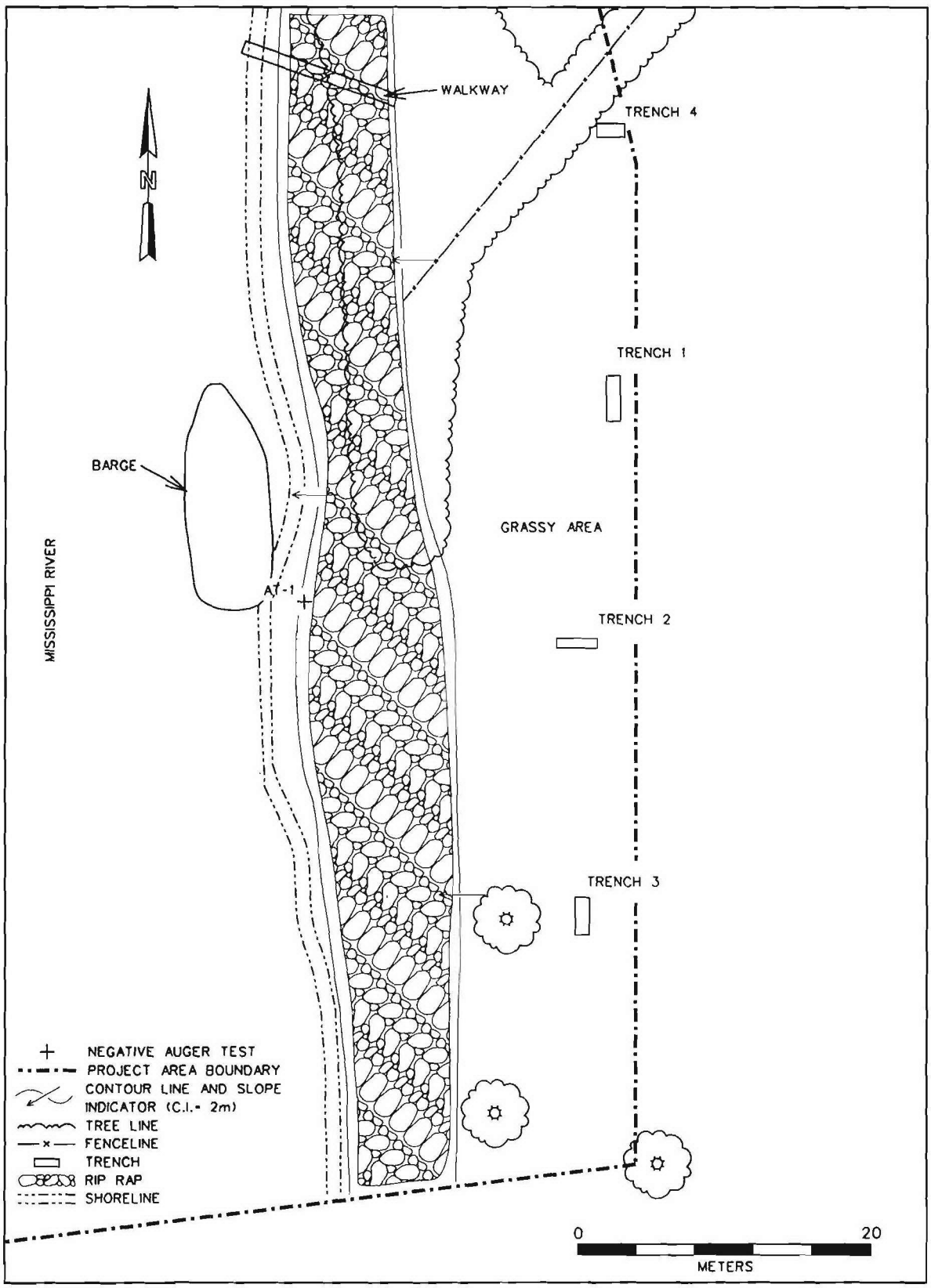


Figure 194. Plan view of Area A depicting the locations of auger tests and backhoe trenches.



Figure 195. **Overview photo of batture portion of Area A, facing north.**



Figure 196. **Overview photo of shore portion of Area A, facing south.**

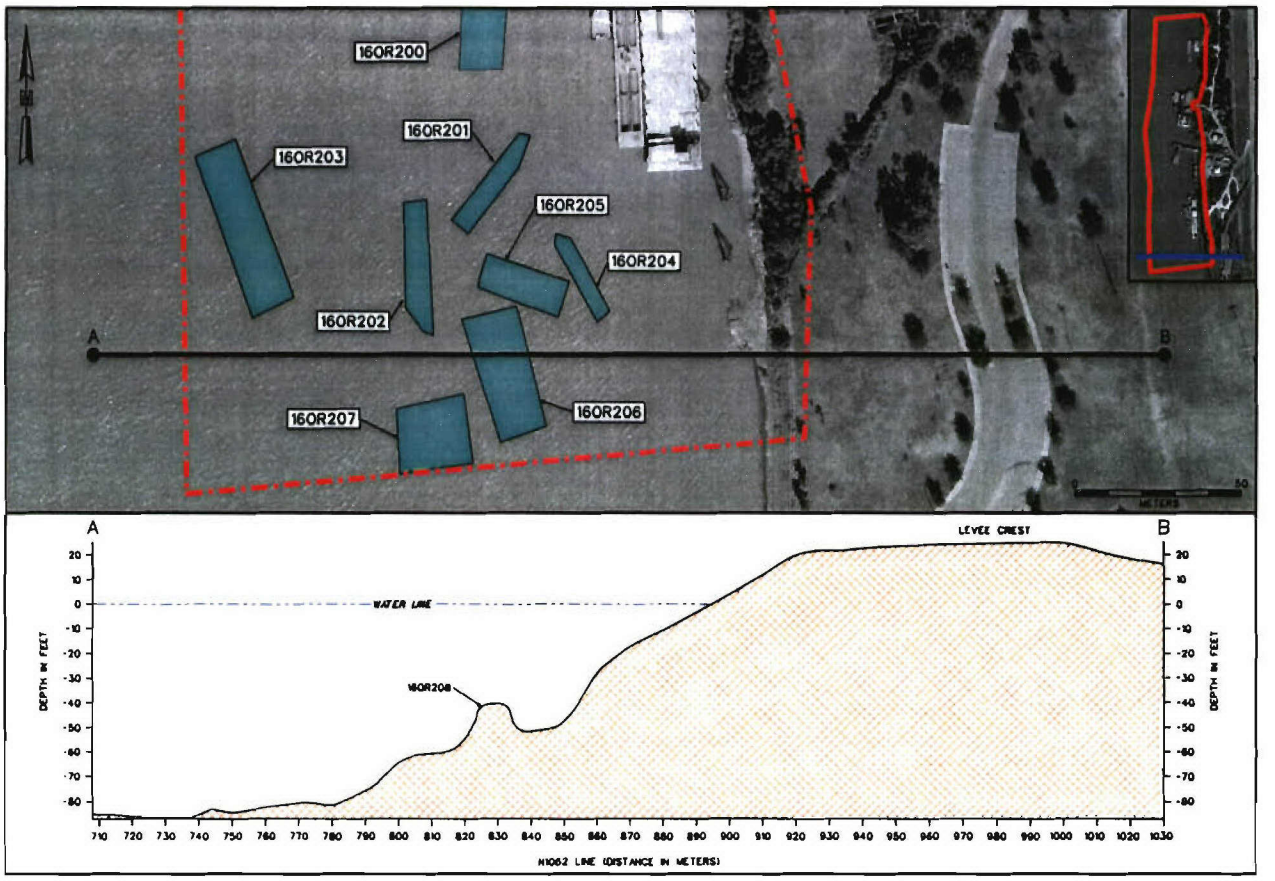


Figure 197. **Topographic profile of the N1052 line depicting the project area in the vicinity of Area A.**

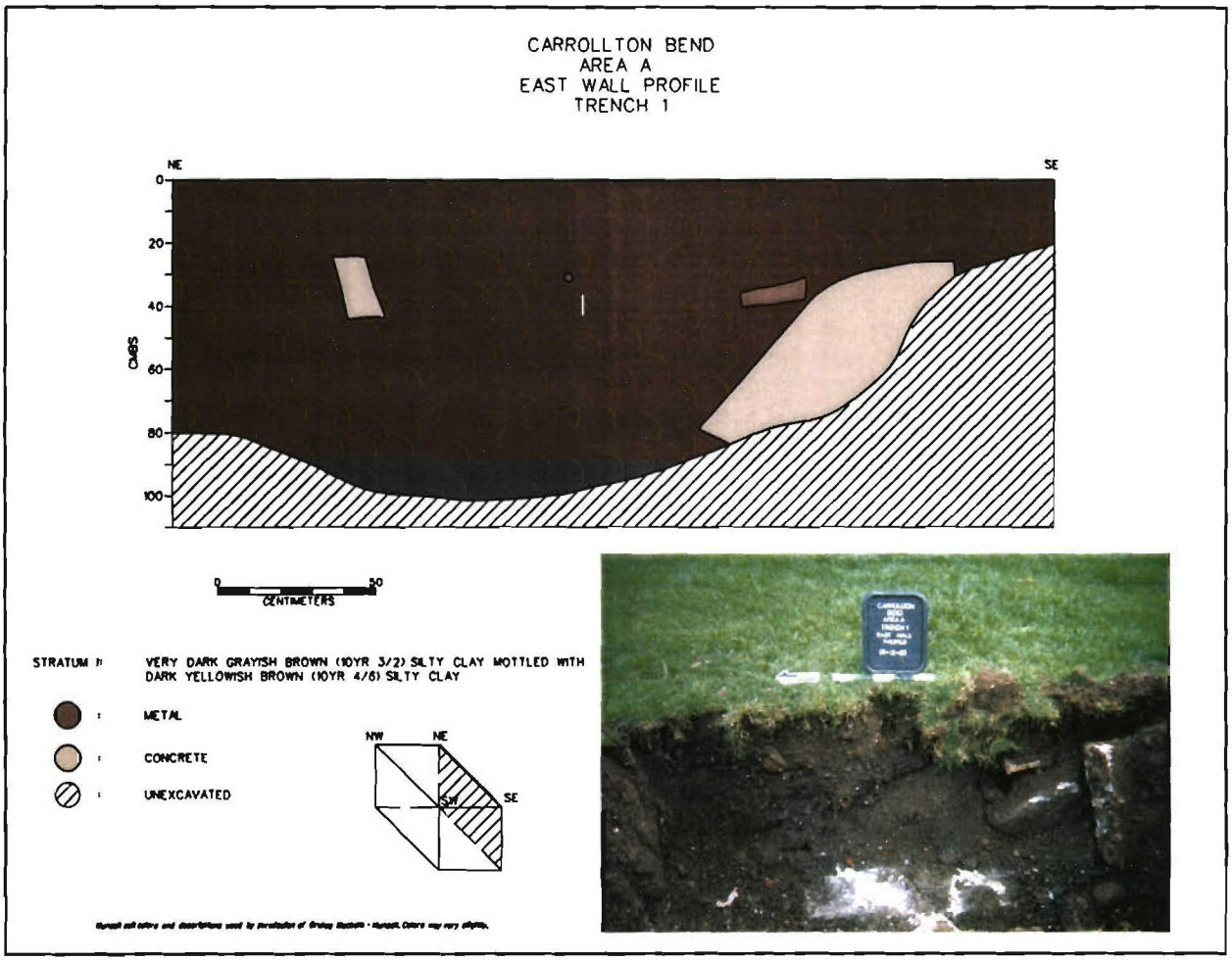


Figure 198. Profile and photo of Trench 1 within Area A.

Table 18. Cultural material recovered from Area A.

Provenance	Stratum	Material	Function	Type	Subtype	Possible Date	Total
Trench 1	I	Ceramic	architectural	tile	yellow-glaze		1
			food indeterminate	whiteware	blue-glaze	1820-present	1
			indeterminate	hard-paste porcelain	undecorated		2
		Glass	food indeterminate	container	amber		1
					colorless		1
		Metal	mechanical	washer	indeterminate		1
Trench 1 Total							**7**
Trench 2	I	Ceramic	architectural	tile	floor		1
			food indeterminate	hard-paste porcelain	undecorated		2
		Glass	food consumption	bottle	Coke	1903-present	1
			food indeterminate	bottle	amber		1
						1903-present	1
					colorless	1903-present	1
						1929-1954	1
Trench 2 Total							**8**
Trench 3	I	Brick	architectural	redware	pipe		1
		Ceramic	architectural	hard paste	cream		1
				tile	floor		1
			food consumption	hard-paste porcelain	tea-cup		2
			food indeterminate	hard-paste porcelain	undecorated		1
				refined earthenware	indeterminate		1
				whiteware	blue-glaze	1820-present	1
			indeterminate	hard-paste porcelain	undecorated		1
			indeterminate domestic	hard-paste porcelain	undecorated		1
		Ferrous	construction hardware	nail	wire	1890-present	1
		Glass	architectural	window	light green		1
					light aqua		2
			food indeterminate	bottle	amber		3
						1903-present	1
						1904-1969	1
					colorless	1946-present	1
					green	1903-present	1
				container	colorless		2
					cobalt		1
			hygiene	bottle	Clorox	1945-1962	1
			indeterminate	indeterminate	milk glass		2
			indeterminate domestic	stopper	colorless		1
		Slate	architectural	roofing	shingle		2
	I Total						**30**
	II	Ceramic	food indeterminate	whiteware	container	1830-present	1
		Glass	food consumption	bottle	beverage	1903-present	1
			food indeterminate	jar	indeterminate		1
		Plastic	food consumption	Stick	Popsicle	late 1970s	1
	II Total						**4**
Trench 3 Total							**34**
Shoreline	Surface	Glass	food indeterminate	bottle	amber	1929-1954	1
		Metal	furniture	basket	wire		1
Shore Total							**2**
Grand Total							**51**

able metal items. No intact cultural deposits were identified in Trench 1.

Trench 2

Positioned approximately 3 m (9.8 ft) east of the bankline and oriented east to west, Trench 2 measured 1.2 x 3.1 m (3.9 x 10.2 ft) in size. Trench 2 was excavated to a maximum depth of 200 cmbs (78.7 inbs), and it exhibited a single stratum in profile (Figure 199). Stratum I consisted of an artificial fill deposit as indicated by the mottled nature of the soil. The deposit was described as brown (10YR 4/3) sandy clay mottled with yellowish brown (10YR 5/6) sandy clay and dark yellowish brown (10YR 4/4) sandy clay.

A total of 8 artifacts were analyzed from Stratum I. These items consisted of 2 amber bottle glass shards (1903 to present), 1 Coca-Cola soda bottle shard (1903 to present), 1 clear bottle glass shard (1929 to 1954), 1 clear bottle glass shard (post 1903), 2 hard-paste porcelain sherds, and 1 piece of floor tiling. Noted within the trench fill, but not collected were fragments of brick, metal, shell, wood boards soaked with creosote, plastic, and concrete. Trench 2 consisted of artificial fill, and no intact cultural deposits were identified.

Trench 3

Trench 3 measured 2 x 3 m (6.6 x 9.8 ft) in size. Oriented north to south, Trench 3 was situated approximately 5 m (15.4 ft) east of the bankline. It was excavated to a maximum depth of 240 cmbs (94.5 inbs), revealing two strata in profile (Figure 200). Stratum I was described as dark brown (10YR 3/3) silty sandy loam mottled with dark yellowish brown (10YR 4/6) silty sandy loam that extended from the ground surface to 94 cmbs (0 to 37 inbs). Pieces of brick, glass, metal, and *Rangia* shell were present throughout Stratum I. Portions of the north and south sides of Trench 3 were not excavated due to the presence of large pieces of construction debris; therefore, within the center of the trench, Stratum II was excavated to a maximum depth of 240 cmbs (94.5 inbs). Stratum II was characterized by very dark gray (10YR 3/1) clay mottled with dark greenish gray (Gley 1 4/10Y) clay. Similar to Stratum I, Stratum II yielded glass, ceramics, synthetics, concrete, and brick. Noted but not collected was a large piece of a telephone pole that was present in the center of the profile of Stratum II, i.e., between 100 to 140 cmbs (39.4 to 55.1 inbs). Immediately below this stratum was a concentration of *Rangia* shell that extended to the base of the trench. A strong odor of creosote permeated the soil from Stratum II. The majority of these items were noted only in the field; however, a sample of the material was collected and subsequently analyzed and is discussed below (Table 18).

A total of 34 artifacts were collected from Trench 3; 30 of these items originated from Stratum I, while 4 artifacts were collected from Stratum II. The cultural material recovered from Stratum I consisted of 1 hard-paste brick fragment, 3 pieces of window glass, 1 Clorox bleach glass bottle shard (1945 to 1962), 1 blown glass bottle stopper with plastic gaskets, 3 amber bottle glass shards, 1 amber bottle glass shard (post 1903), 1 amber bottle glass shard (1904-1969), 1 clear bottle glass shard (post 1946), 2 clear container glass shards, 1 cobalt container glass shard, 2 indeterminate milk glass shards, 1 green bottle glass shard (post 1903), 1 fragment of a ceramic sewer pipe, 1 fragment of a flooring tile, 3 undecorated porcelain sherds, 1 blue-glazed whiteware sherd (post 1820), 2 transfer-printed porcelain tea cup sherds (Figure 201), 1 refined earthenware sherd, 1 wire nail (post 1890), and 2 slate shingle fragments. In addition, 4 artifacts were collected during the excavation of Stratum II. This material consisted of a single plastic Popsicle stick fragment (late 1970 to early 1980), 1 sherd of transfer-printed whiteware (1830-present), 1 clear glass bottle shard (1903 to present), and 1 shard of a milk glass jar. Based upon the variety of material recovered during the excavation of Trench 3, it was determined that these strata represented separate fill episodes. No intact cultural deposits were identified.

Trench 4

The final excavated backhoe trench within Area A was situated approximately 8 m (26.2 ft) east of the bankline and it measured 1 x 3 m (3.3 x 9.8 ft) in size. Oriented east to west, Trench 4 was mechanically excavated to a depth of 90 cmbs (37 inbs), and it exhibited only a single stratum in profile (Figure 202). Stratum I consisted of very dark grayish brown (2.5Y 3/2)

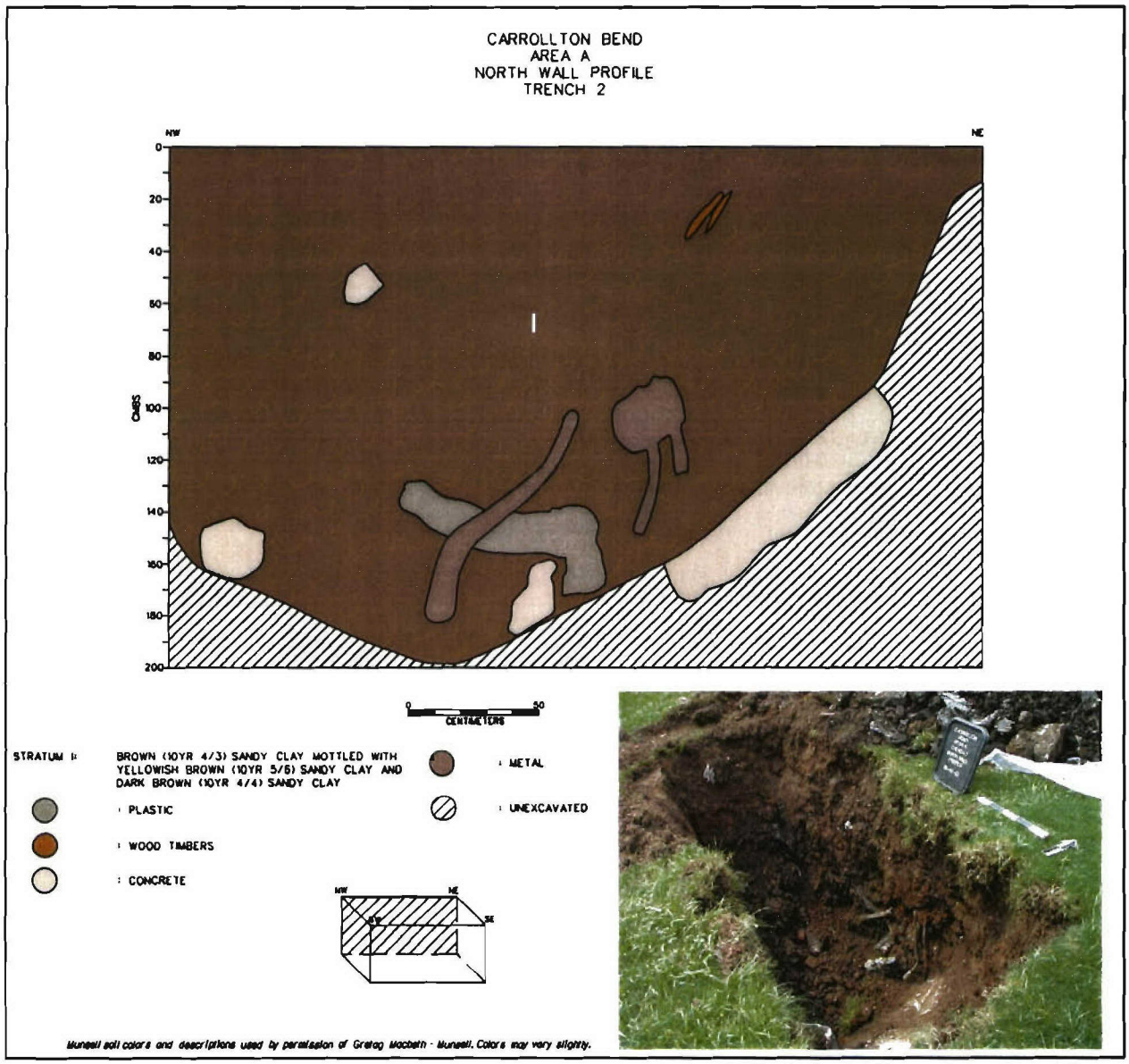


Figure 199. Profile and photo of Trench 2 within Area A.

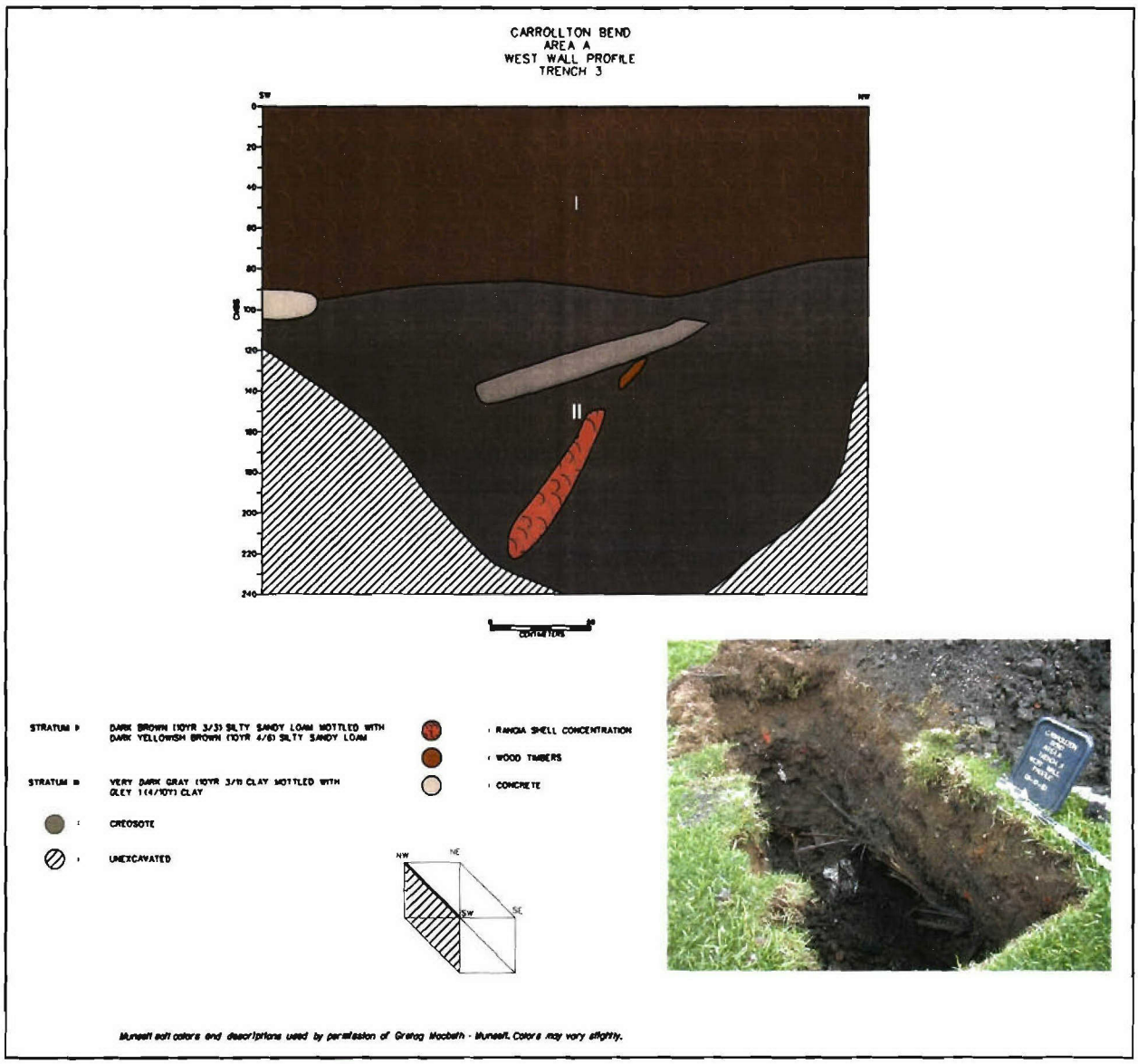


Figure 200. Profile and photo of Trench 3 within Area A.

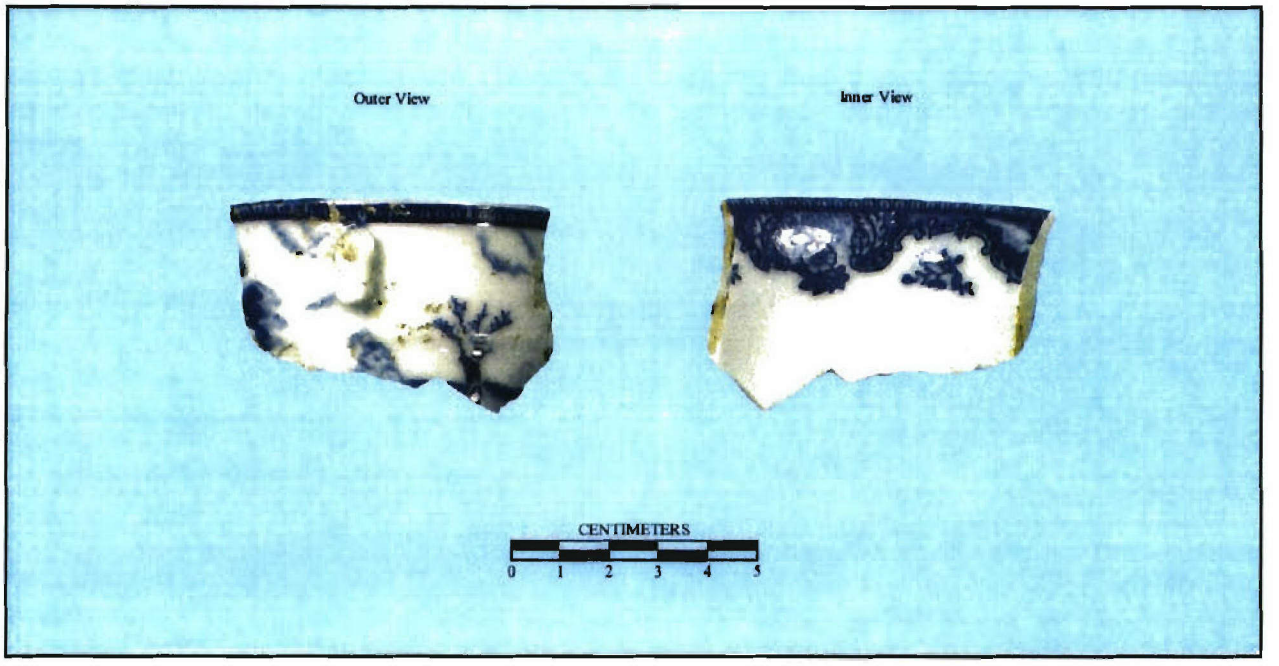


Figure 201. **Side view of a partial porcelain teacup (FS# 38) recovered during trench excavation at Carrollton Bend.**

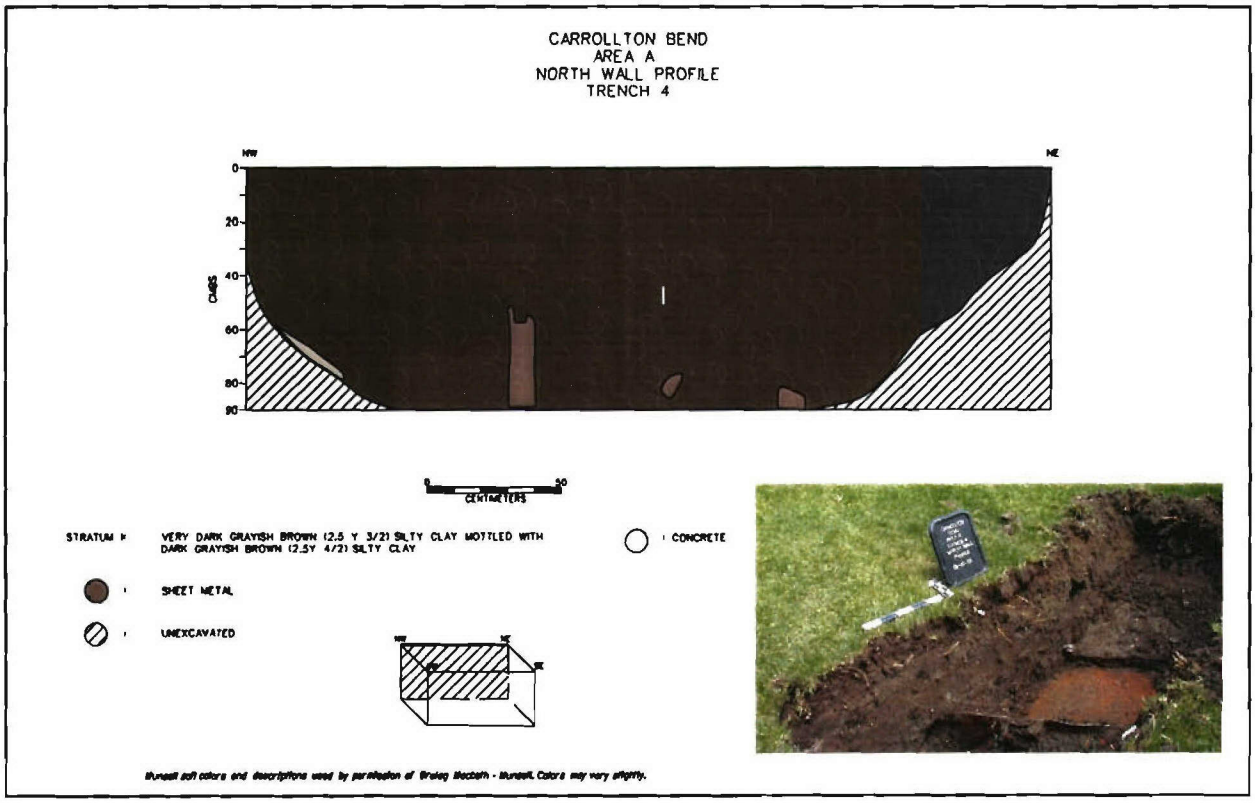


Figure 202. Profile and photo of Trench 4 within Area A.

silty clay mottled with dark grayish brown (2.5Y 4/2) silty clay. Excavation was terminated at 90 cmbs (37 inbs) due to the presence of a large piece of an iron barge platform that could not be moved or crushed by the backhoe. Noted within the trench fill, but not collected, were fragments of brick, asphalt, and concrete. No temporally diagnostic materials were identified during the excavation of this trench; hence, no material was collected from the field. Due to the truncated excavation, Trench 4 failed to reveal any evidence of intact cultural deposits; however, this investigation did indicate that the examined area consisted of fill and construction debris.

Auger Testing

Due to the presence of riprap and scattered remnants of broken concrete, gravel, and debris along the shoreline of the Mississippi River, only a single auger test was excavated successfully in Area A. Auger Test 1 was positioned on the shoreline approximately 1.76 m (5.76 ft) below the bankline of the batture. It extended to a maximum depth of 60 cmbs (23.62 inbs), and it exhibited two strata in profile (Figure 203). Stratum I reached from the ground surface to a depth of 30 cmbs (11.81 inbs) and it consisted of a layer of grayish brown (10YR 5/2) sandy clay mottled with strong brown (7.5YR 4/6) sandy clay. Stratum II was characterized as gray (2.5Y 5/1) clay that ranged from 30 to 60 cmbs (11.81 to 23.62 inbs); it was terminated due to an impenetrable fill layer. The water table, as well as crushed shell, was reached at 30 cmbs (11.81 inbs). Pieces of rubber and tar were noted at 55 cmbs (21.65 inbs); however, these items were not collected. No intact cultural deposits were noted in Auger Test 1, and due to the early termination of the auger test, the original riverbed sediments were not reached.

Pedestrian survey of the shoreline, however, resulted in the recovery of a single amber glass bottle base shard that dated from between 1929 and 1954, as well as a metal weave basket similar to those used on golf courses to hold golf balls. In addition, brick fragments, broken cement slabs, portions of brick piers, glass shards, and modern trash and debris was noted on the surface but not collected. These materials do not suggest the presence of an intact archeological deposit, but they likely were redeposited by the river or from fill deposits eroding from the unprotected portions of the bankline. Archival research confirms that the entirety of Area A was used as a city dump until it was transformed into a recreational park during the mid 1960s.

Summary of Area A

Excavations in Area A revealed deposits of artificial fill along both the upper bankline (i.e., batture) and the lower shoreline. Trench excavation documented fill beginning at the ground surface, which had an approximate elevation 3.76 m (12.32 ft) NGVD, and extending to a maximum excavated depth of 2.4 mbs (7.9 ftbs). Furthermore, Auger Test 1, which was positioned on the shoreline at an approximate elevation of 2 m (6.6 ft) NGVD, extended to maximum depth of 0.6 mbs (2 ftbs). Thus, considering the difference in elevation between the batture bankline and the shoreline (i.e., approximately 1.76 m [5.76 ft]), over 2.6 m (8.5 ft) of fill is present within Area A.

Finally, while cultural material was collected during the examination of Area A, this artifact assemblage reflected the highly disturbed nature of the fill deposits present in the area; the artifacts range in date from 1820 to present. Trench 3 clearly shows this disturbance with the recovery of a plastic Popsicle stick, which dated from the late 1970s to early 1980s, at a depth of 160 to 170 cmbs (63 to 67 inbs). No natural soil deposition was encountered during subsurface investigations at Area A. Likewise, no evidence of intact cultural deposits or historic standing structures was identified. Thus, no additional fieldwork is recommended for Area A.

Area B (Bisso Towboat Company)

Area B was located on the Bisso Towboat Company property; it is situated north of Area A on the east bank of the Mississippi River. The Area of Potential Effect was defined within this property as measuring approximately 165 m (541.4 ft) length, while the width of the project area ranged from 25.7 to 37 m (84.3 to 121.9 ft); it encompassed approximately 0.53 ha (1.3 ac) of land (Figure 204). A level and maintained lawn, a gravel parking area, and a metal ramp and dock leading to a work barge and towboats characterized the upper bank, or batture, of

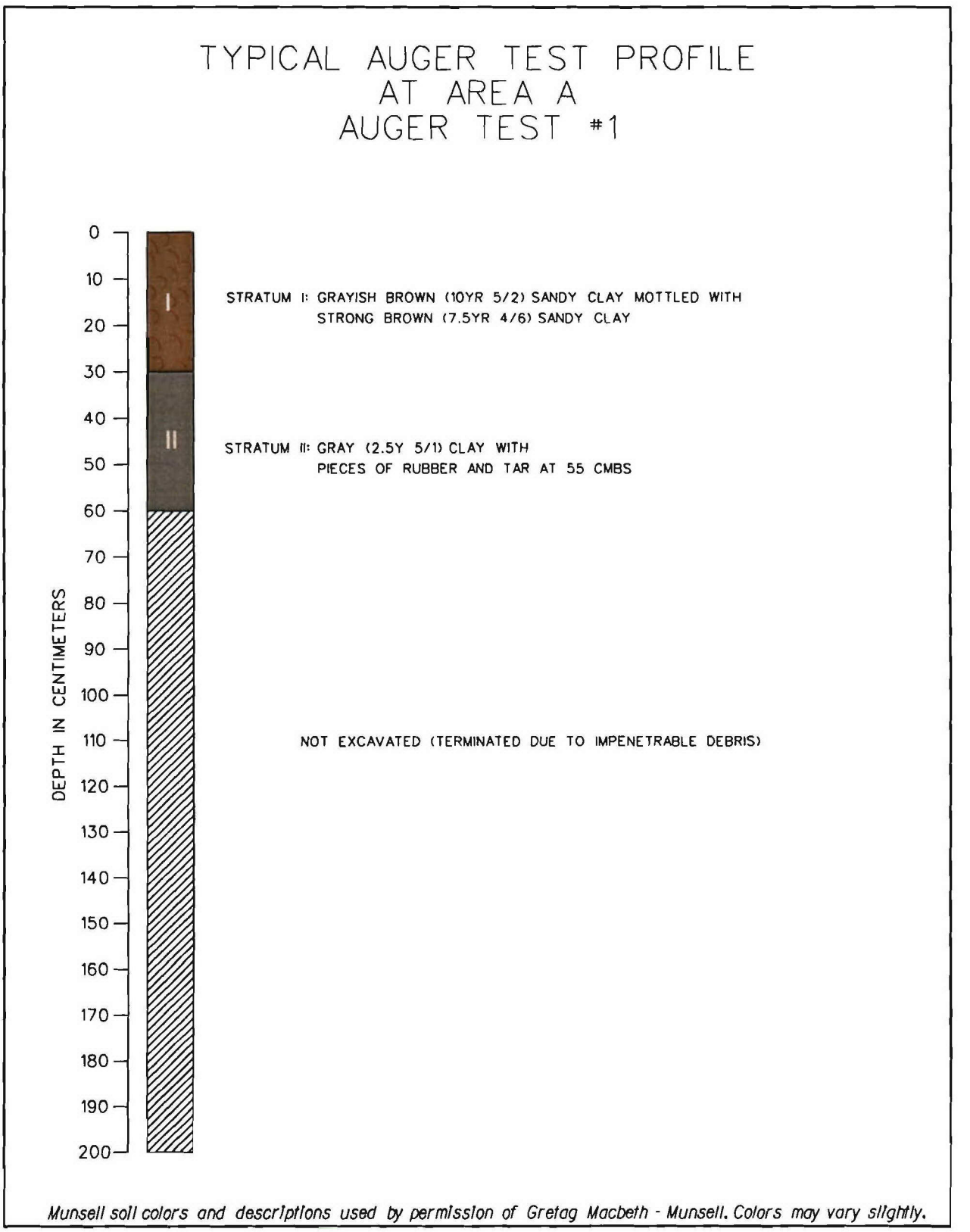


Figure 203. Profile of Auger Test 1 within Area A.

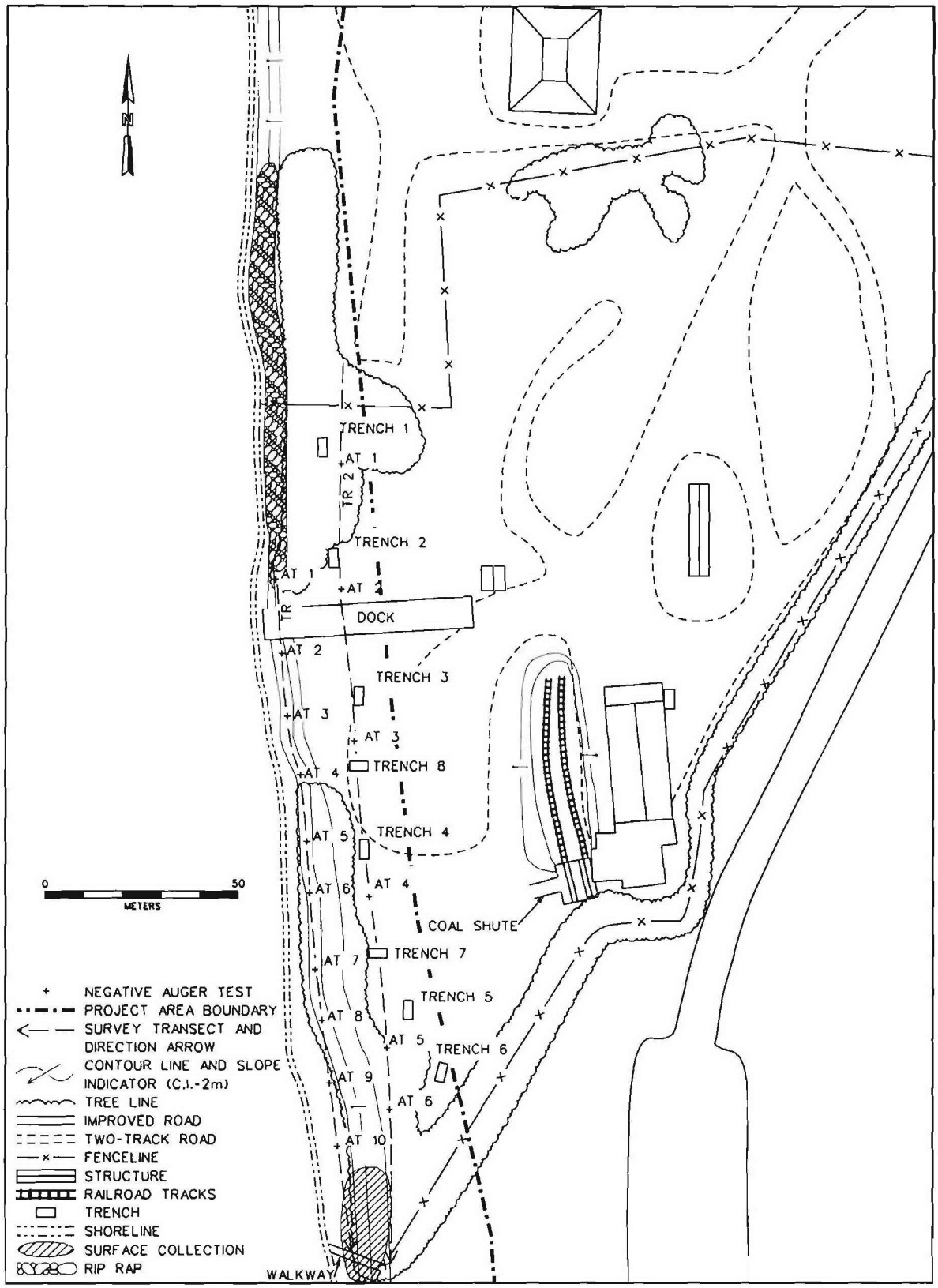


Figure 204. Plan view of Area B depicting the locations of auger tests and backhoe trenches.

Area B, while thick vines and a few small trees grow along the bankline of the Mississippi River (Figure 205). Portions of the bankline itself were protected from the erosional forces of the Mississippi River by large amounts of concrete; however, a narrow shoreline was accessible at low tide for this cultural resources investigation (Figure 206).

A total of 8 of 8 (100 percent) planned backhoe trenches and 16 of 16 (100 percent) planned auger tests were excavated within the Area of Potential Effect associated with Area B (Figure 206). A single survey transect of backhoe trenches was placed parallel to the bankline on the batture portion of Area B. Trenches 1 through 8 were positioned approximately every 10 to 20 m (32.8 to 65.6 ft) throughout the 27 x 165 m (89 x 541.4 ft) wide Area of Potential Effect. In addition to these trenches, two parallel survey transects were utilized to conduct the auger test survey. Transect 1 was positioned along the shoreline; it was composed of 10 successfully excavated auger tests (Auger Tests 1-10). Transect 2 contained 6 successfully excavated auger tests (Auger Tests 1-6) along the upper bankline.

Topographically, Area B is similar to Area A in respect to the configuration of the extant levee and batture; i.e., the batture on Bisso Towboat Company property is relatively level with the crown of the levee, which should have been approximately 1.5 to 2.4 m (5 to 8 ft) above the ground surface (Figure 207). This property has approximately 100 years of fill accumulation composed of clean (i.e., fill from the excavation of swimming pools) and trash related fill that aided in stabilizing the bank. In addition, portions were raised and graded to accommodate the railroad spur used during the period when the company was focused on coal transportation and distribution. The difference in elevation between the batture bankline (6.27 m [20.59 ft] NGVD) and the shoreline (1.96 m [6.44 ft] NGVD) is approximately 4.31 m (14.15 ft). Finally, the topographic profile indicates a very gradual riverbank slope, suggesting that little cutting or caving of the bankline has occurred in this area.

Backhoe Trenching

As mentioned above, the batture portion of this project parcel was characterized by gravel parking areas and a dock facility, as well as scattered clusters of discarded industrial and domestic equipment (i.e., refrigerators, ship cables, trailer, etc.). Visual reconnaissance of this area resulted in the recovery of 12 artifacts from the ground surface (Table 19). This artifact assemblage consisted of 2 ironstone sherds (post 1840), 2 stoneware sherds (post 1880), 1 whiteware sherd (post 1820), 1 stoneware jug sherd (1805-1900), 1 terracotta container sherd, 1 clear milk bottle glass sherd (1930-1940), 1 clear bottle glass sherd, 1 clear bottle glass shard (1920-1964), 1 light aqua bottle glass shard, and 1 cobalt blue container glass shard.

During survey, 8 of 8 (100 percent) of planned backhoe trenches were excavated successfully throughout Area B. They were positioned within an area noted to contain trash and structural debris. Discussions with personnel from Bisso Towboat Company indicated that in the past, cut banks were filled from dirt obtained from swimming pools foundations within Orleans Parish; i.e., swimming pool companies would bring dirt they had excavated previously to Area B to fill the crevasses along the bankline (Ruben Dupre, personal communication: August 8, 2003). No intact cultural deposits were documented on the property. Stratigraphic profiles for Trenches 1 through 8 are discussed below.

Trench 1

Situated approximately 6 m (19.7 ft) east of the bankline, Trench 1 measured 2 x 3.7 m (6.6 x 12 ft) in size and it was oriented in a north-south direction. The trench was excavated to a maximum depth of 204 cmbs (80.3 inbs), and it exhibited two strata in profile (Figure 208). Stratum I was characterized as very dark gray (2.5Y 3/1) clay mixed with shell that reached from ground surface to a maximum depth of 36 cmbs (14.2 inbs). Stratum II was described as a layer of greenish gray (Gley 1 5/1 /10GY) clay mottled with dark reddish brown (5YR 3/4) clay mixed with shell and pockets of sand. This stra-



Figure 205. **Overview photo of batture portion of Area B, facing north.**



Figure 206. Overview photo of shore portion of Area B, facing northeast.

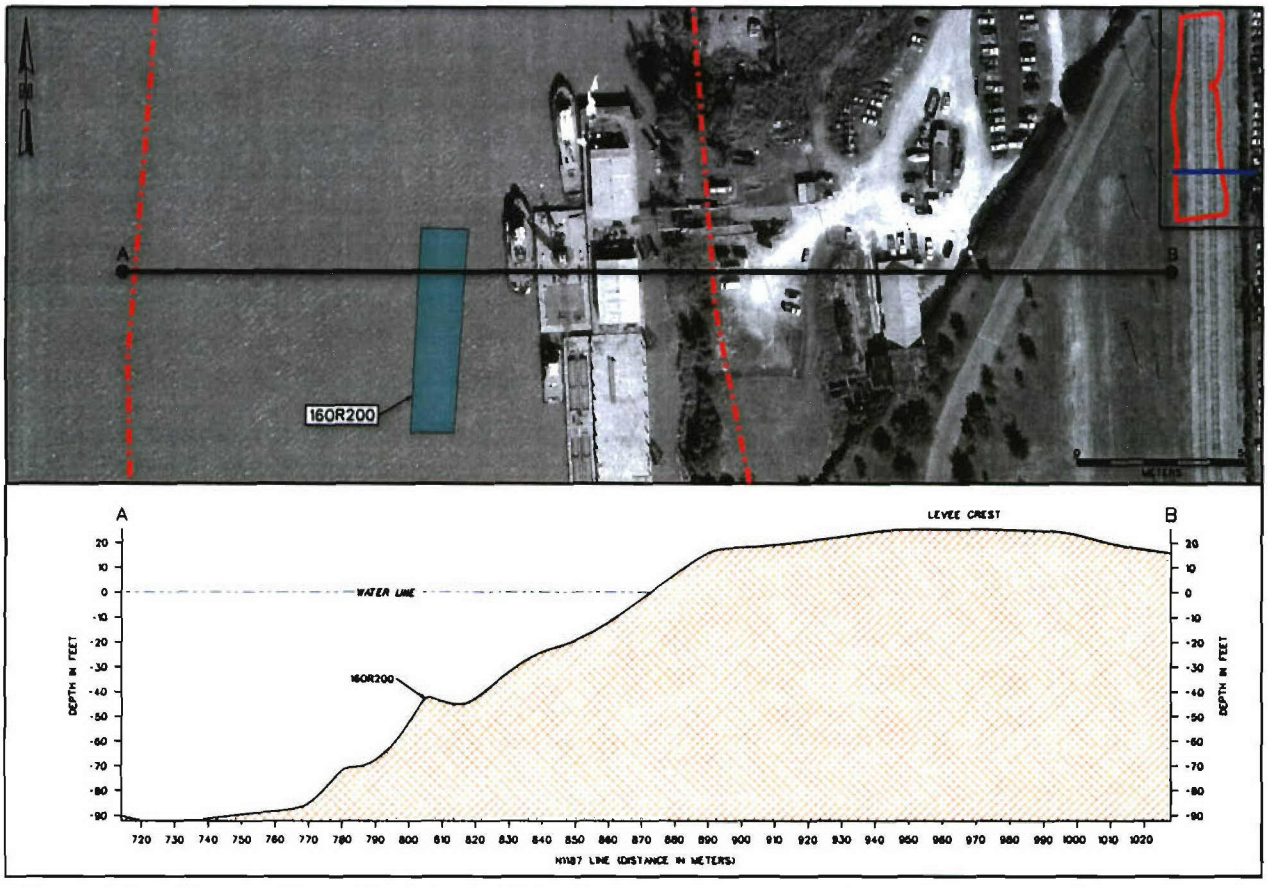


Figure 207. **Topographic profile of the N1187 line depicting the project area in the vicinity of Area B.**

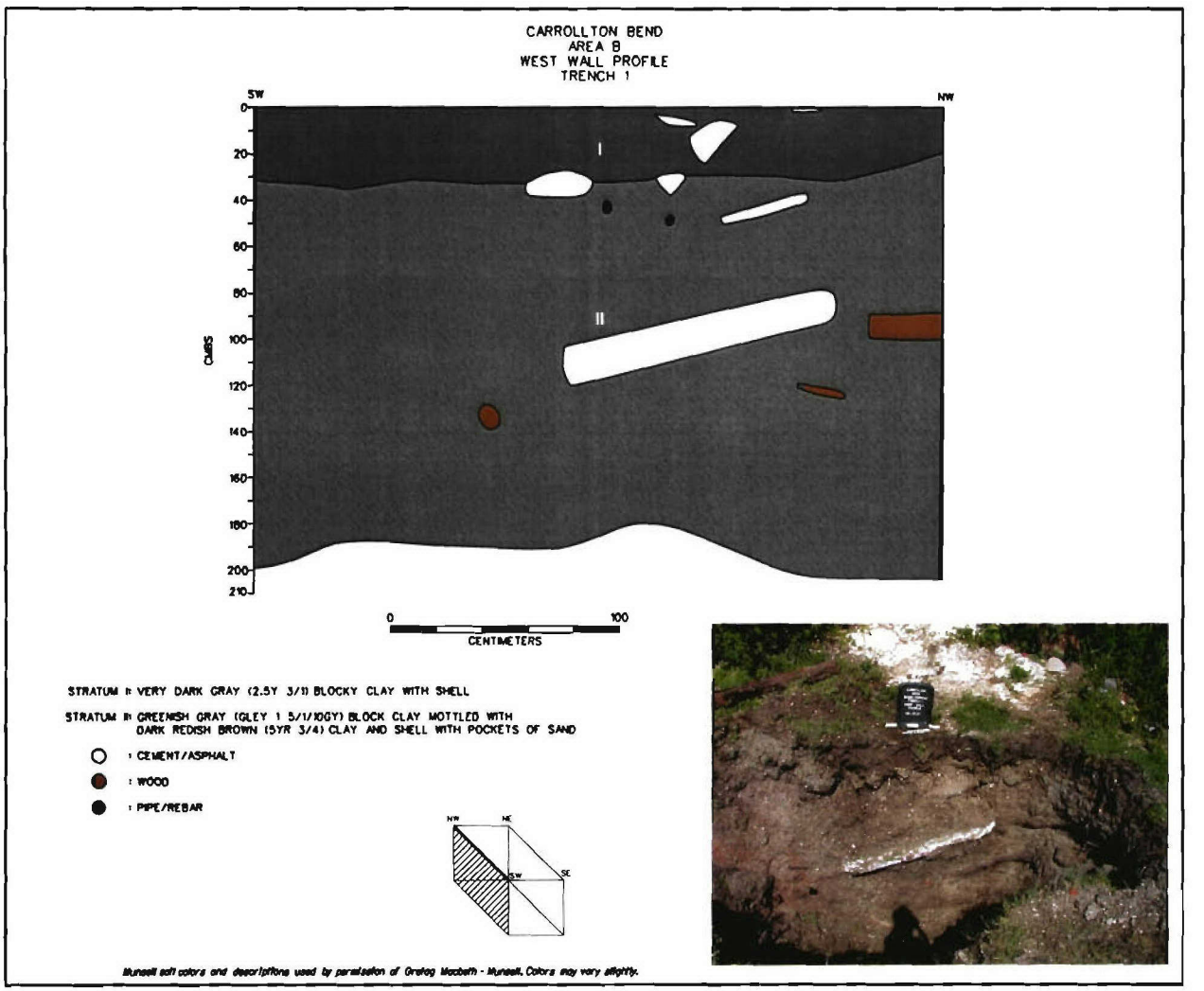


Figure 208. Profile and photo of Trench 1 within Area B.

Table 19. Cultural material recovered during pedestrian survey of areas within Area B.

Provenance	Material	Function	Type	Subtype	Possible Date	Total
Bank - Surface	Ceramic	food indeterminate	ironstone	undecorated	1840-present	2
			stoneware	blue sponge/ Bristol slip	1880-present	1
			whiteware	embossed	1820-present	1
		food storage	stoneware	jug	1805-1900	1
				Bristol slip/ hand-painted	1880-present	1
		indeterminate	terracotta	container		1
	Glass	food storage	bottle	colorless	1930-1940	1
		indeterminate	bottle	colorless		1
					1920-1964	1
				light aqua		1
			container	cobalt		1
Bank Total						**12**
Shore - Shore	Glass	hygiene	bottle	Sure-Klean bleach	1903-present	2
	Brick	architectural	stiff mud	indeterminate		1
				machine-made		2
					1901-present	1
	Ceramic	architectural	tile	indeterminate		1
		food indeterminate	ironstone	container	1845-present	1
		indeterminate storage	yellow-ware	Rockingham	1830-1900	1
	Glass	food consumption	bottle	Wright root beer	1934-1936	1
				colorless	1903-present	1
		indeterminate	bottle	amber	1954-present	1
				colorless	1903-present	2
					1940-1954	1
					1940-present	1
			container	colorless		1
				cobalt		1
			jar	cobalt	1903-present	1
		indeterminate domestic	jar	cosmetic/ pharmaceutical	1903-present	2
		medicine	jar	pharmaceutical	1928-1986	1
		toys/games	marble	white/clear/orange		1
	Synthetic	architectural	tile	indeterminate		1
Shore Total						**24**
Train/Coal Chute	Brick	architectural	stiff mud	machine-made	1927	1
	Cuprous	security	key	indeterminate		1
				Master Lock	1924-present	14
	Glass	food consumption	bottle	Braque's root beer	1934-present	1
				Wright root beer	1934-1963	1
				colorless	1903-present	1
				applied color label	1934-present	1
		indeterminate	bottle	colorless	1903-present	2
			jar	cobalt	1916-present	1
Train/Coal Chute Total						**23**
Grand Total						**59**

Table 20. Cultural material recovered during trench excavation within Area B.

Trench	Stratum	Material	Function	Type	Subtype	Possible Age	Total
1	II	Ceramic	food consumption	ironstone	cup	1845-present	1
1 Total							**1**
2	I	Aluminum	food consumption	can	Rex Draft root beer	1958-present	1
				pull-tab	beverage	1962-1974	2
		Brick	architectural	stiff mud	machine-made		1
		Ferrous	construction hardware	screw	indeterminate		1
2 Total							**5**
3	II	Glass	indeterminate	container	indeterminate		1
		Shell	personal clothing	button	4-hole		1
	III	Ceramic	food indeterminate	hard-paste porcelain	undecorated		1
		Glass	architectural	window	light aqua		1
			indeterminate	bottle	amber		1
3 Total							**5**
4	III	Ceramic	food indeterminate	whiteware	undecorated	1820-present	1
		Glass	indeterminate	bottle	colorless	1903-present	1
				container	colorless		1
4 Total							**3**
5	I	Ceramic	food consumption	ironstone	plate	1845-present	1
			indeterminate	hard-paste porcelain	undecorated		1
		Glass	indeterminate	indeterminate	indeterminate		1
5 Total							**3**
6	I	Ceramic	food consumption	ironstone	plate	1840-present	1
				whiteware	undecorated	1820-present	1
		Glass	indeterminate	container	colorless		1
	II	Aluminum	food consumption	pull-tab	beverage	1962-1974	4
6 Total							**7**

tum extended from the base of Stratum I to an excavated depth of 204 cmbs (80.3 inbs).

No intact stratigraphic or cultural deposits were identified during the excavation of Trench 1. The fill deposits associated with Trench 1 (i.e., Strata I and II) produced cement slabs, light bulb glass, brick, redware drain pipe, spike nails, electrical wire, a metal pipe, a garden hose, rebar, candy bar wrappers, plastic, and rubber. In addition to the aforementioned material identified from the fill, a single edge-decorated ironstone sherd cup handle and rim that dated from 1845 to present was collected from Stratum II, i.e., between 40 to 50 cmbs (15.7 to 19.6 inbs) (Table 20).

Trench 2

Also oriented north to south, Trench 2 measured 0.9 x 1.5 m (2.9 x 4.9 ft) in size, and it was positioned approximately 5 m (16.4 ft) east of the edge of the bank. Mechanically excavated to a maximum depth of 200 cmbs (78.7 inbs), this trench exhibited two strata in profile (Figure 209). Stratum I was described as a layer of brown (10YR 4/3) silty loam mottled with dark grayish brown (10YR 4/2) silty loam and dark yellowish brown (10YR 4/4) silty loam. Separate concentrations of shell and asphalt were noted in Stratum I, as was a large piece of unmodified wood. Stratum I extended from the ground surface to a maximum depth of 140 cmbs (55 inbs). The subsoil, Stratum II, continued from the base of Stratum I to a maximum excavated depth of 200 cmbs (78.7 inbs). Stratum II was defined as a deposit of dark yellowish brown (10YR 4/4) silty clay mottled with very dark grayish brown (10YR 3/1) silty clay and dark grayish brown (10YR 4/2) silty clay.

Both soil horizons produced a large quantity of material that was noted in the field, but not collected. This included brick, bottle glass, aluminum cans, concrete slabs, and terra cotta sewer pipe fragments. Only 5 artifacts were collected during the excavation of Stratum I of Trench 2; they consisted of 2 aluminum can tops with pull tab openings (1962-1974), 1 Rex Draft Root Beer aluminum can (1958 to present), 1 machine-made brick fragment, and 1 iron screw

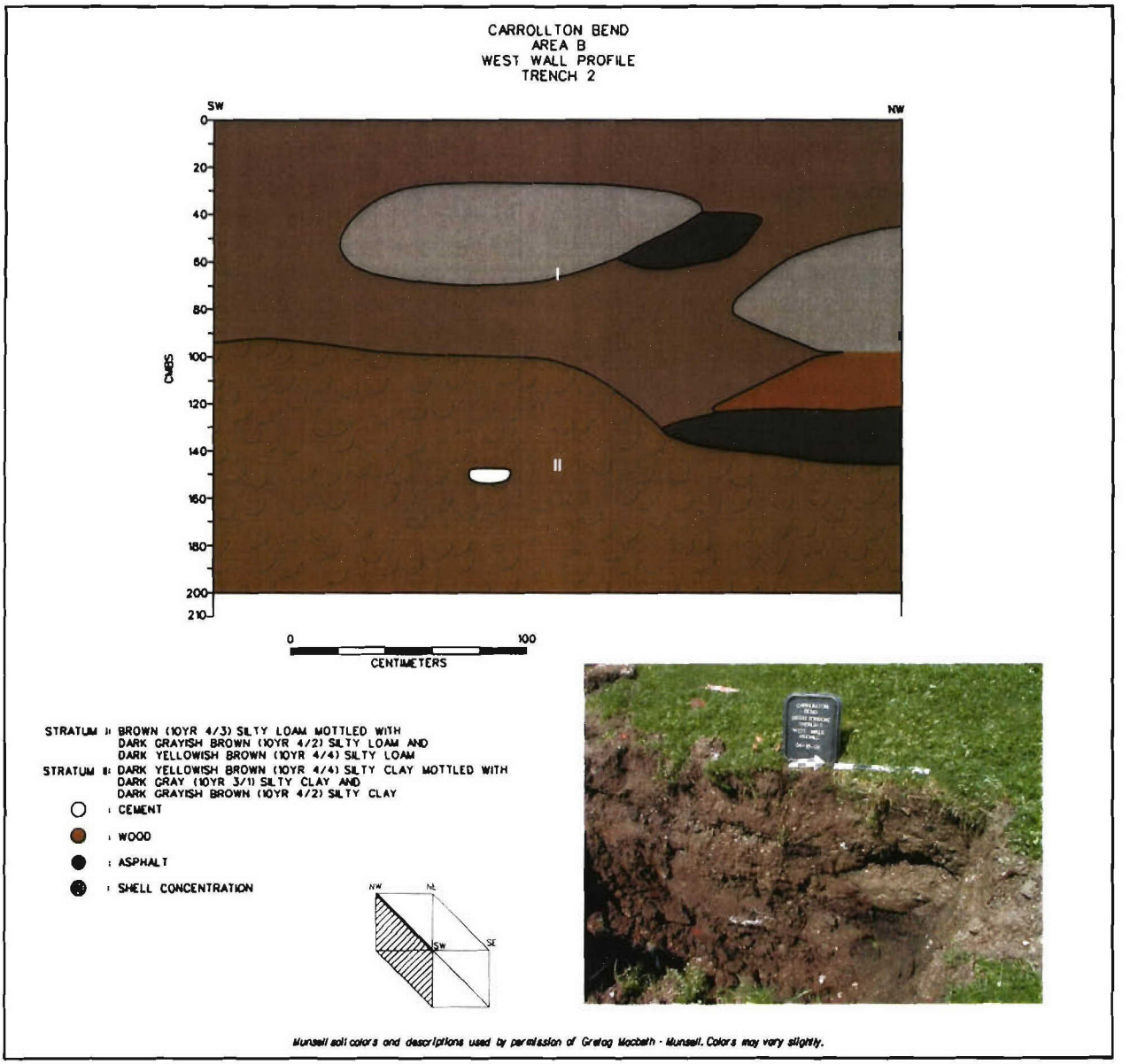


Figure 209. Profile and photo of Trench 2 within Area B.

(Table 20). Examination of the trench soil profile and the extent of the debris present throughout indicated that no intact cultural or stratigraphic deposits were encountered during the excavation of Trench 2.

Trench 3

Measuring approximately 1.5 x 3 m (4.9 x 9.8 ft) in size and oriented north to south, Trench 3 was positioned only 2.5 m (8.2 ft) east of the bankline. Trench 3 exhibited three strata in profile; it was excavated to a depth of 200 cmbs (78.7 inbs) (Figure 210). Stratum Ia, a 23 cmbs (9.1 inbs) thick layer of crushed limestone, represented the recent accumulation of gravels used for the adjacent parking lot. It was underlain by a thin (2 cm [0.8 in] thick) lens of brown (10YR 4/3) silty clay; the lens was identified as Stratum Ib. Stratum II was recorded as a deposit of greenish black (Gley 2.5/5GY) clay that extended from the base of Stratum I and that ranged in depth from 60 cmbs (23.6 inbs) to 100 cmbs (39.7 inbs). Finally, Stratum III was characterized as greenish black (Gley 2.5/10Y) clay that continued from the base of Stratum II to a depth of 200 cmbs (39.7 to 78.7 inbs).

Artificial fill was documented throughout Trench 3; it included brick, plastic sheeting, glass shards, rope, asphalt, and large pieces of concrete. *Rangia* shell also was documented throughout Stratum II and portions of Stratum III, while a strong odor of creosote permeated from these exposed soils. A sample of the cultural material was collected from Strata II and III. Artifacts recovered from Stratum II consisted of a single clear bottle glass shard and one 4-hole shell button, while Stratum III produced 1 shard of window glass, 1 indeterminate amber glass shard, and 1 undecorated porcelain sherd. The extent of the debris present throughout indicated that no intact cultural or stratigraphic deposits were encountered during the excavation of Trench 3.

Trench 4

Situated approximately 2.5 m (8.2 ft) east of the bankline and oriented in a north-south manner, Trench 4 measured 1 x 1.8 m (3.3 x 5.9 ft) in size. This trench was excavated to a maximum depth of 204 cmbs (80 inbs), and it exhibited four strata in profile (Figure 211). Stratum I was comprised of very dark brown (10YR 2/2) silty loam that extended from 0 to 6 cmbs (0 to 2.4 inbs). This lens capped a layer of crushed limestone (i.e., Stratum II) that ranged in depth from 6 to 26 cmbs (2.4 to 10.2 inbs). Stratum III was described as very dark gray (10YR 3/1) clay mottled with strong brown (7.5YR 4/6) clay and brown (10YR 4/3) clay. It extended from 26 to 95 cmbs (10.2 to 37.4 inbs) in depth across the trench profile. Finally, Stratum IV was recorded as a layer of dark gray (2.5Y 3/1) clay that reached from 95 to 204 cmbs (37.4 to 78.8 inbs).

Strata I and II represented modern deposits of gravel fill and overburden associated with the adjacent parking lot. Cultural material, however, was noted in the field during the examination of Strata III and IV. In fact, a large piece of iron identified at 95 cmbs (37.4 inbs) made further excavation in the north end of the trench impossible, while another piece of iron and a chunk of concrete were exposed in the south end of the trench at this same level; however, it did not interfere with further excavation of the trench. A total of three artifacts were collected from Stratum III between 70 to 100 cmbs (27.5 to 39.3 inbs). These materials consisted of a single whiteware sherd (1820 to present), 1 clear bottle glass shard (1903 to present), and 1 clear container glass shard. Pieces of concrete, wood, brick, and rebar were documented throughout Stratum IV, but not collected. The absence of intact cultural or stratigraphic deposits reflected the disturbed nature of the soils in this area.

Trench 5

Positioned on a north-south orientation, Trench 5 was situated 5 m (16.4 ft) east of the Mississippi River bankline and adjacent to an encroaching cut bank. This trench measured 2 x 2.4 m (3.3 x 7.9 ft) in size, and it was excavated to a total depth of 120 cmbs (47.2 inbs) (Figure 212). Exhibiting a single stratum in profile, Stratum I consisted of a deposit of brown (10YR 4/3) silty sandy clay. The trench excavation was terminated at 120 cmbs (47.2 inbs) due to inundation of water. Trench 5 consisted of artificial fill, and no cultural deposits were encountered.

Only 3 artifacts were collected during the excavation of Trench 5; these included a single hand-painted ironstone plate sherd (1845 to present), 1 indeterminate porcelain sherd, and 1

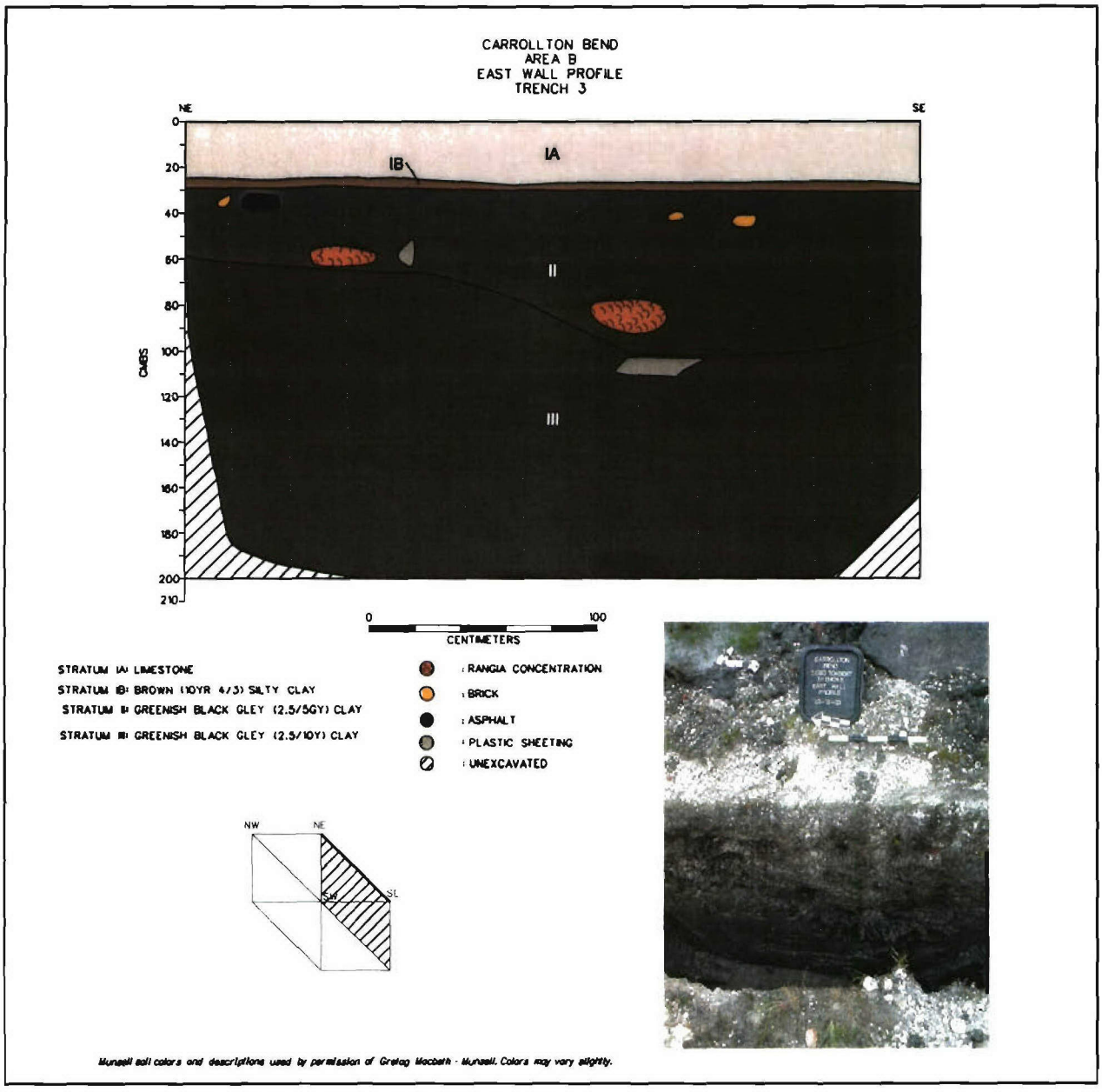


Figure 210. **Profile and photo of Trench 3 within Area B.**

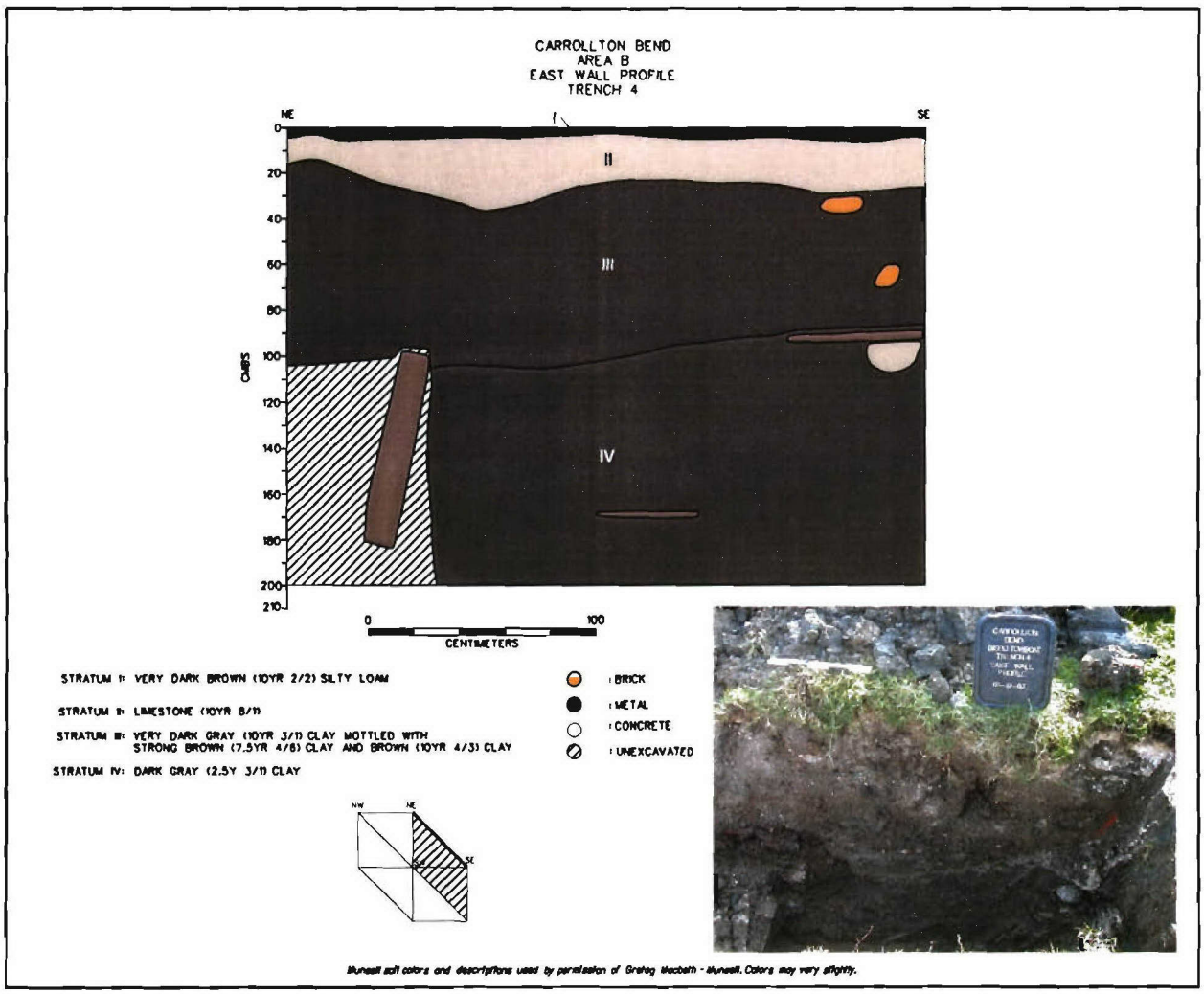


Figure 211. Profile and photo of Trench 4 within Area B.

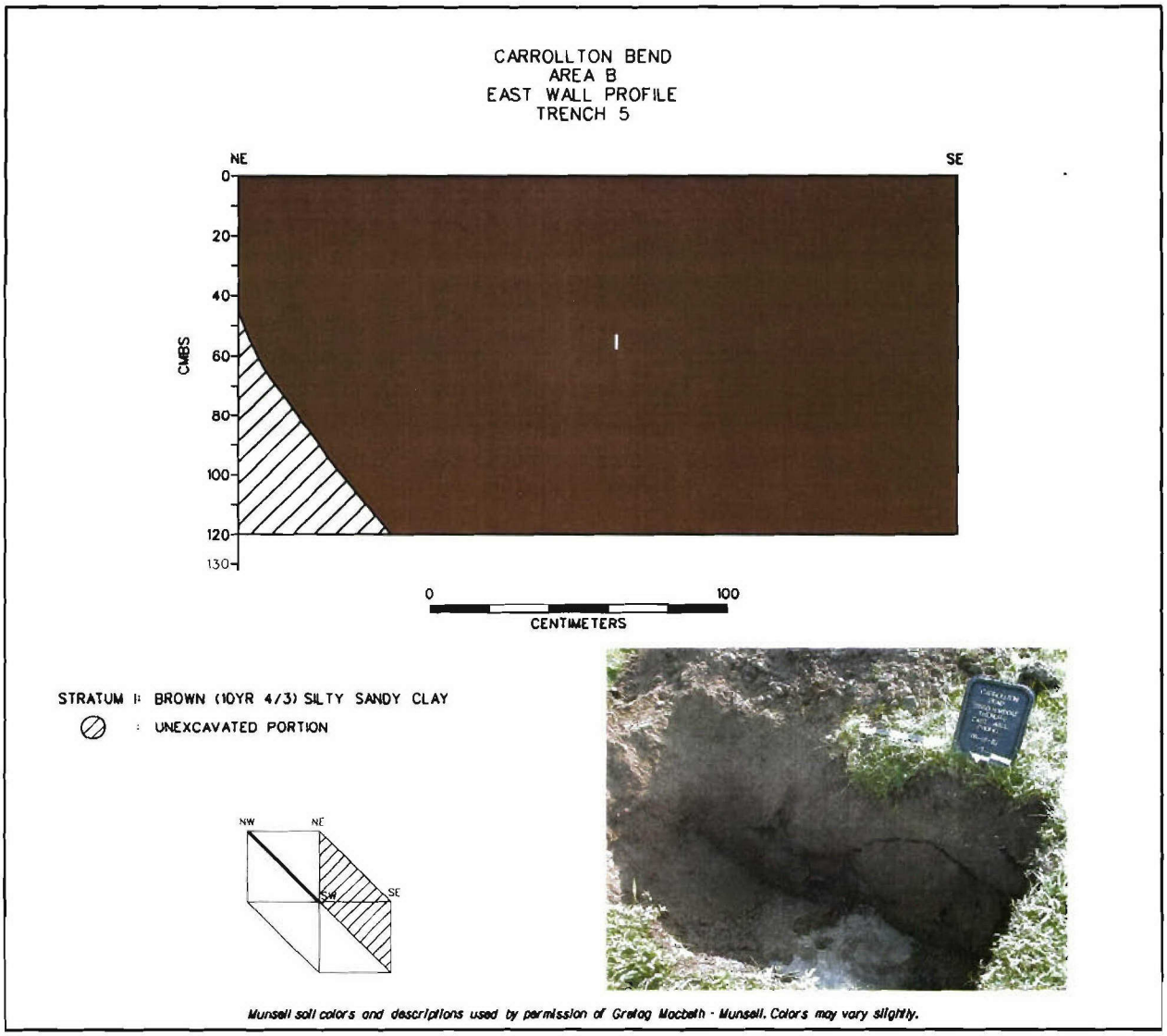


Figure 212. **Profile and photo of Trench 5 within Area B.**

unidentifiable glass shard (Table 20). These artifacts were recovered from Stratum I at a depth of 60 to 70 cmbs (23.6 to 27.5 inbs). In addition to the above-mentioned material, a porcelain pipe fitting, terracotta pipe fragments, brick fragments, concrete, and *Rangia* shell were noted in the backdirt but not collected. The relatively clean nature of the fill and the simple soil pedon may indicate that this area was stabilized by the addition of dirt fill brought to the project parcel from swimming pool excavations throughout greater New Orleans (Rueben Dupre, personal communication: August 4, 2003).

Trench 6

Positioned slightly askew due to an encroaching cut bank, Trench 6 was situated approximately 2 m (6.6 ft) east of the riverbank. The trench measured 1 x 2.5 m (3.3 x 8.2 ft) in size, and it was excavated to a maximum depth of 218 cmbs (85.8 inbs); three strata were documented in profile (Figure 213). Stratum I was characterized as dark grayish brown (10YR 4/2) silty sandy loam that reached from 0 to 50 cmbs (0 to 19.7 inbs) in depth. Stratum II consisted of a deposit of yellowish brown (10YR 5/6) silty sandy clay mottled with dark grayish brown (10YR3/2) silty sandy clay and gray (10YR 5/1) sandy clay. Stratum II extended from the base of Stratum I to a maximum excavated depth of 136 cmbs (53.5 inbs). Stratum IIIa was described as dark yellowish brown (10YR 4/4) silty sandy clay mottled with very dark gray (10 YR 3/2) silty sandy clay; it extended from 136 to 194 cmbs (53.5 to 76.4 inbs). Finally, an indistinct layer of greenish black (Gley I 2.5/10Y) clay mixed with *Rangia* shell was documented as Stratum IIIb. Stratum IIIb ranged from 194 to 218 cmbs (76.4 to 85.8 inbs) in depth.

Miscellaneous debris was noted throughout Stratum I, including several large asphalt concentrations. Cultural material collected from Stratum I consisted of a single undecorated whiteware sherd (post 1820), 1 hand-painted ironstone plate sherd (1845 to present), and 1 clear container glass shard. A lens of mixed asphalt and *Rangia* shell was documented at 100 cmbs (39.4 inbs) within Stratum II, and it extended across most of the trench profile. In addition, 4 aluminum can pull-tabs were collected from Stratum II at 80 cmbs (31.5 inbs) to 90 cmbs (35.4 inbs); pull-tabs were manufactured between 1962 and 1974. This investigation confirmed that Trench 6 consisted of artificial fill, and that no intact cultural deposits were present.

Trench 7

Oriented east to west, Trench 7 was located approximately 3 m (9.8 ft) east of the bankline. The trench measured 2 x 3 m (6.6 x 9.8 ft) in size, and it was excavated to a maximum depth of 204 cmbs (80.3 inbs); two strata were documented in profile (Figure 214). Stratum I was documented as a deposit of dark grayish brown (10YR 4/2) silty clay mottled with very dark grayish brown (2.5Y 3/2) silty clay. Pieces of brick, plastic, and *Rangia* shell were noted throughout Stratum I. This stratum extended from 0 to 70 cmbs (0 to 27.6 inbs) in depth. Stratum II consisted of dark gray (2.5Y 4/1) silty clay lightly mottled with dark grayish brown (2.5Y 4/2) silty clay; it reached from 70 to 204 cmbs (70.9 to 80.3 inbs) in depth. Several large chunks of concrete were excavated from this trench and ground water was documented at 200 cmbs (78.74 inbs). Although cultural material was noted in the field, no temporally diagnostic artifacts were identified; thus, no artifacts were collected from Trench 7. The excavation of this trench confirmed the presence of artificial fill to a depth of approximately 2 m (6.6 ft).

Trench 8

The final trench excavated within Area B, Trench 8 was situated 2 m (6.6 ft) east of the edge of the bankline, and it was oriented in an east-west manner. The trench measured 1.3 x 3 m (4.3 x 9.8 ft) in size. It was excavated by backhoe to a depth of 210 cmbs (82.7 inbs), and it exhibited three strata in profile (Figure 215). Stratum Ia consisted of a layer of crushed limestone that capped a deposit of dark brown (10YR 3/3) clay, which was identified as Stratum Ib. Both Strata Ia and Ib were excavated from 0 to 30 cmbs (0 to 11.8 inbs). This stratum represented a prepared surface for the landscaped area found adjacent to the current parking lot of Bisso Towboat Company; construction debris was noted throughout the level. Stratum II was documented as a layer of yellowish brown (10YR 5/6) silty clay mottled with strong brown (7.5YR 4/6) silty clay and dark gray (10YR 4/1)

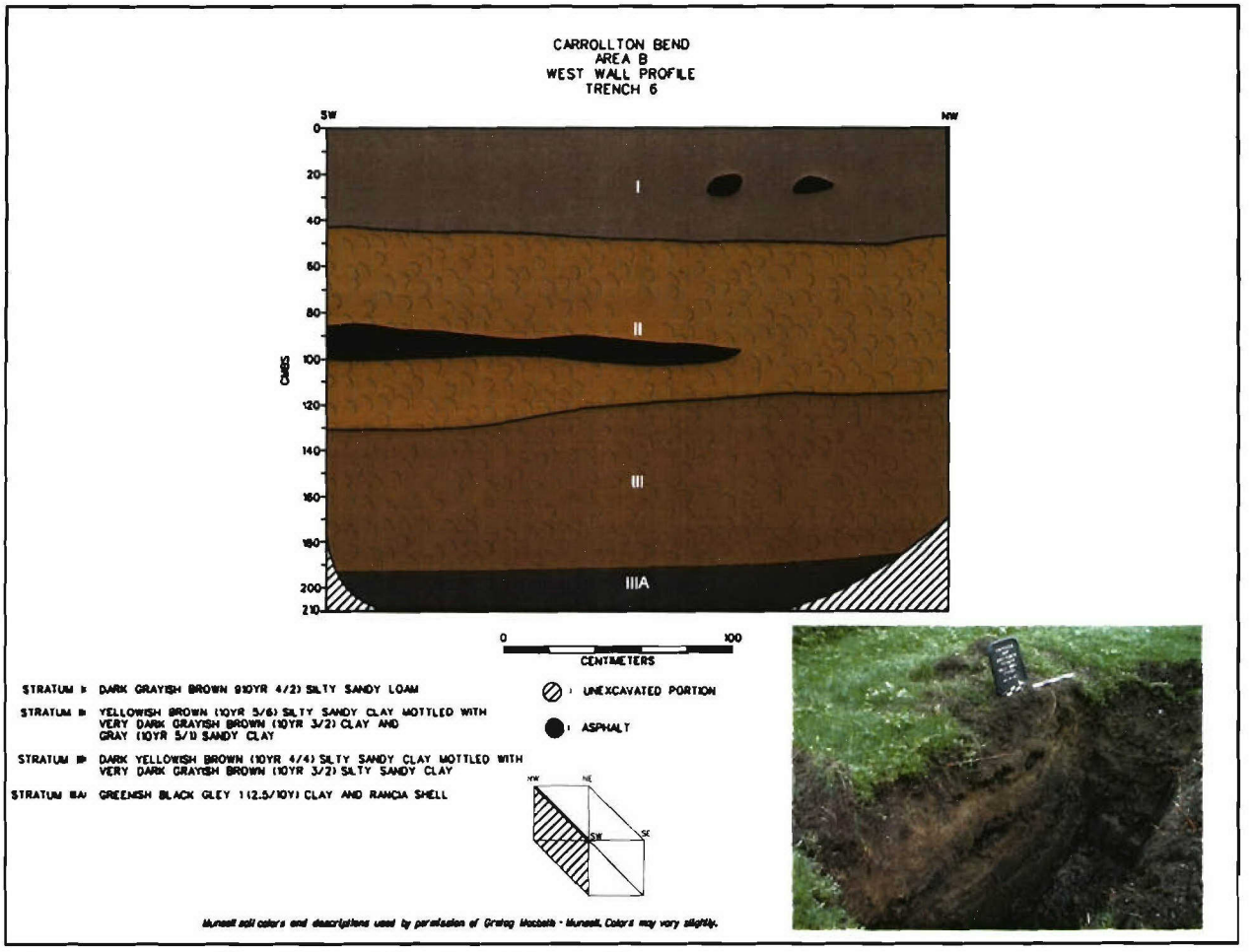


Figure 213. Profile and photo of Trench 6 within Area B.

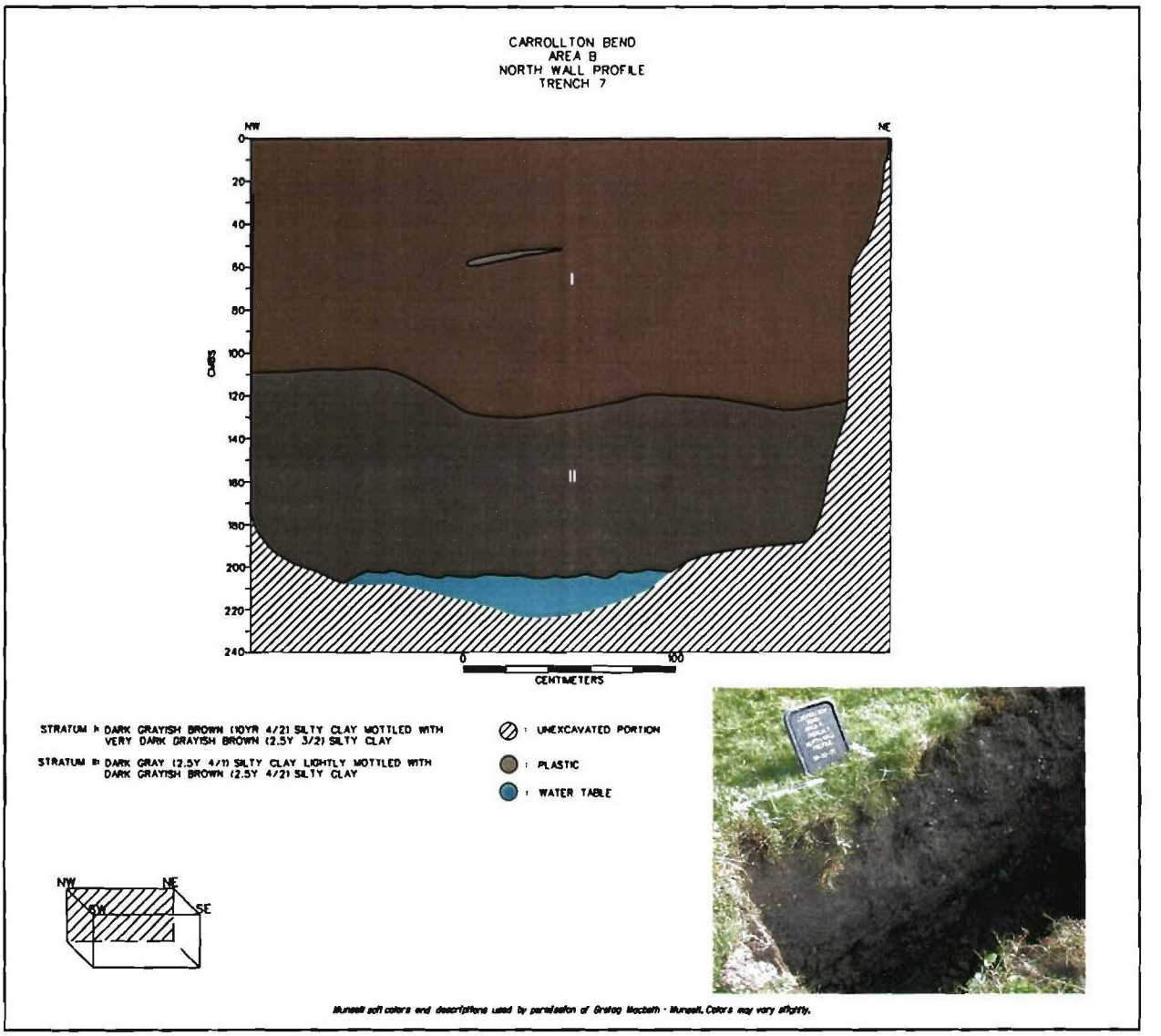


Figure 214. Profile and photo of Trench 7 within Area B.

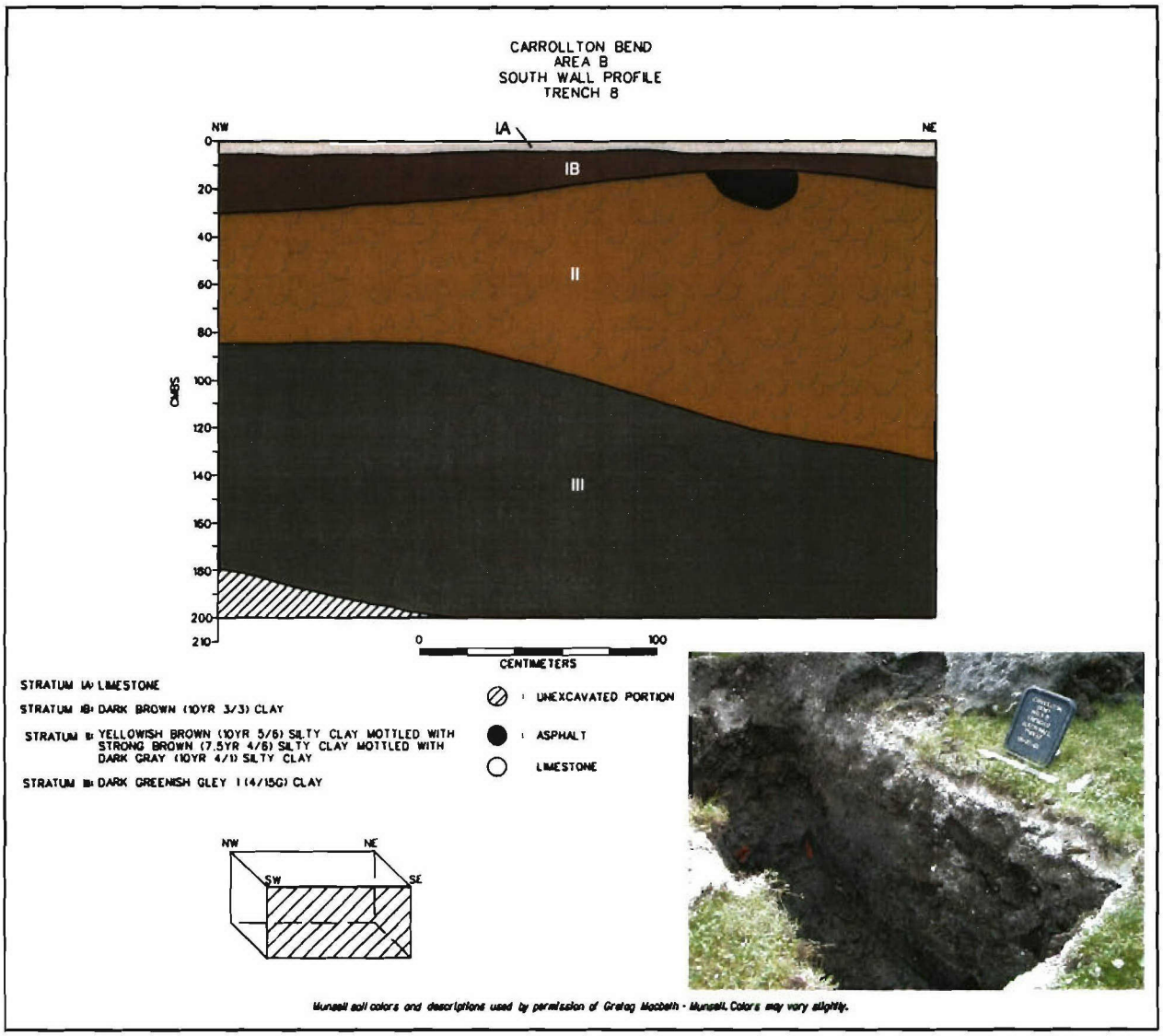


Figure 215. **Profile and photo of Trench 8 within Area B.**

silty clay that reached from the base of Stratum Ib to a maximum excavated depth of 134 cmbs (52.8 inbs). A large piece of asphalt was documented in the upper portion of soil horizon, while brick, cement, and modern trash were documented throughout the stratum. Finally, Stratum III was characterized as a deposit of dark greenish (Gley 1 4/15G) clay that extended from 134 to 210 cmbs (52.8 to 82.7 inbs). Construction debris and modern trash also were recorded in Stratum III, while the water table was breached at a depth of 200 cmbs (78.7 inbs). Although cultural materials were noted in the field, no temporally diagnostic artifacts were identified; thus, no artifacts were collected from Trench 8. The excavation of this trench confirmed the presence of artificial fill to a depth of approximately 2 m (6.6 ft).

Auger Testing

A total of 16 of 16 auger tests (100 percent) were completed within Area B. Of these auger tests, 10 planned tests were situated along the lower shoreline (i.e., Transect 1). They were spaced at 10 to 15 m (32.8 to 49.2 ft) intervals along the shore of the Mississippi River. Distances varied between auger tests due to the presence of scrap metal, riprap, and other inaccessible areas. A representative auger test (i.e., TR 1/AT-1) excavated along the shoreline extended to a maximum depth of 190 cmbs (74.8 inbs) and exhibited two strata in profile (Figure 216). Stratum I was described as a deposit of olive brown (2.5Y 4/3) sandy clay mottled with gray (10YR 5/1) sandy clay; it ranged in depth from 0 to 30 cmbs (11.81 inbs). Stratum II consisted of olive brown (2.5Y 4/3) clay mottled with gray (10YR 6/1) clay. It continued from 30 cmbs to 190 cmbs (11.81 to 74.8 inbs). At 150 cmbs (59.05 inbs), a gravel lens was encountered, and excavation could not proceed beyond 190 cmbs (74.8 inbs).

Only 3 of 10 (30 percent) of the excavated auger tests positioned on the shore could be excavated to the maximum depth 190 cmbs (74.8 inbs) (Figure 217). Fill from these auger tests included brown (10YR 5/3) and grayish brown (10YR 5/1) clays and silty clays. Approximately 70 percent of the auger tests (n=7) were terminated short of this goal due to the presence of dense concentrations of *Rangia* shell. Although *Rangia* is native to the bottomland environments of the Mississippi River, they are not found within the river drainage itself. Thus, the concentrations noted during excavation were identified as artificial fill and the shell does not represent an original ground surface. This investigation confirmed that over approximately 5.81 m (19.1 ft) of fill has been deposited within the Area of Potential Effect associated with Area B.

The remaining 6 of these auger tests were positioned across the upper bank, or batture, of the project area (Transect 2). Only 2 of the 6 (33 percent) planned auger tests (TR 2/AT-2 and AT-6) placed along the upper bankline could be excavated to 200 cmbs (78.74 inbs) (Figure 218) The fill of AT-2 and AT-6 consisted of brown (10YR 4/3) clay containing brick fragments, plastic, and clear glass. Excavation of the remaining four auger tests was terminated due to the presence impenetrable fill.

While no cultural material was collected during the excavation of any of the auger tests, glass shards, aluminum foil, brick fragments, and unidentifiable metal fragments were noted at depths ranging from 20 to 90 cmbs (7.9 to 35.4 inbs). Pedestrian survey of the shoreline resulted in the recovery of 2 Sure-Klean Clorox bottle shards (post 1903), 4 hard-mud brick fragments (one brick dates from 1901 to present), 1 architectural ceramic tile fragment, 1 architectural synthetic tile fragment, 1 ironstone sherd (post 1845), 1 Rockingham yellowware sherd (1830-1900), a complete Wright Root Beer soda bottle (1943-1963), 3 clear bottle glass shards (post 1903), 1 amber bottle glass shard (post 1954), 1 clear bottle glass shard (post 1940), 1 clear bottle glass shard (1940-1954), 1 clear container glass shard, 1 cobalt blue container glass shard, 3 cobalt blue jar shards (post 1903), 1 pharmaceutical jar shard (1928-1986), and 1 toy marble (Table 18; Figures 219 and 220). In addition, brick fragments, broken cement slabs, glass shards, and modern trash and debris was noted on the surface but not collected. These materials do not represent an intact archeological deposit, but likely were deposited by the river or eroded from the fill deposits.

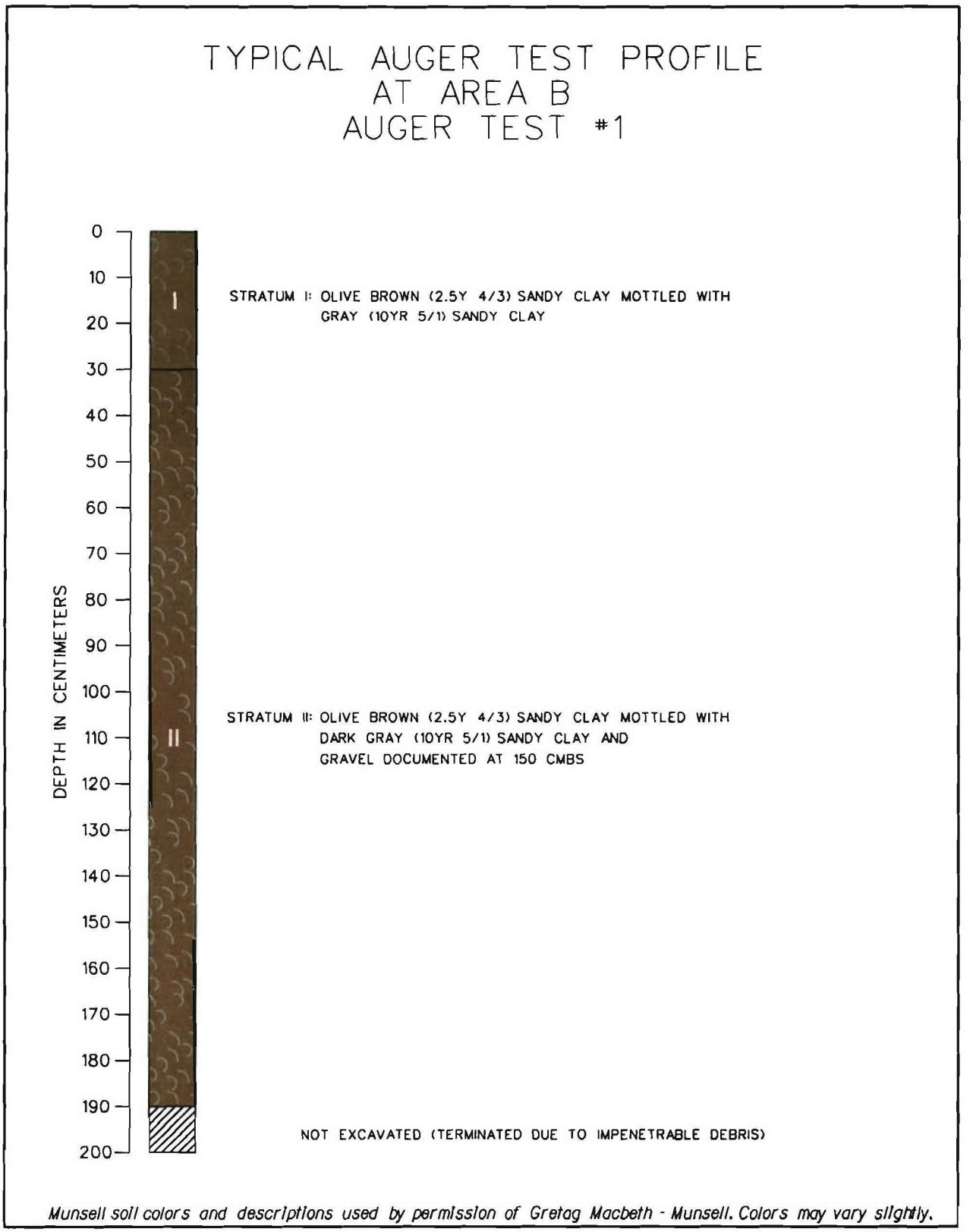


Figure 216. Profile of Auger Test 1 from Transect 1 within Area B.

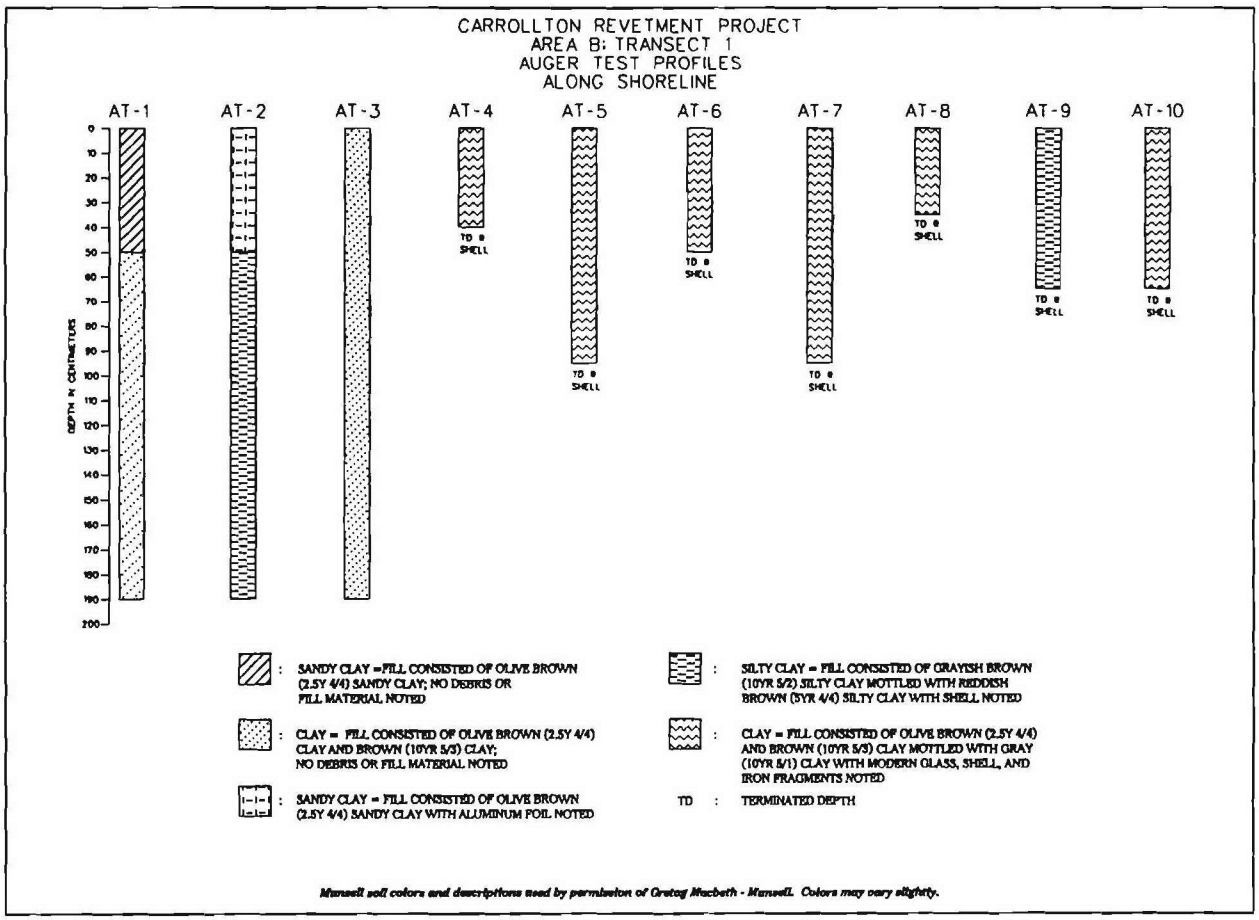


Figure 217. Schematic representation of auger test profiles excavated on the shoreline of Area B, Bisso Towboat Company.

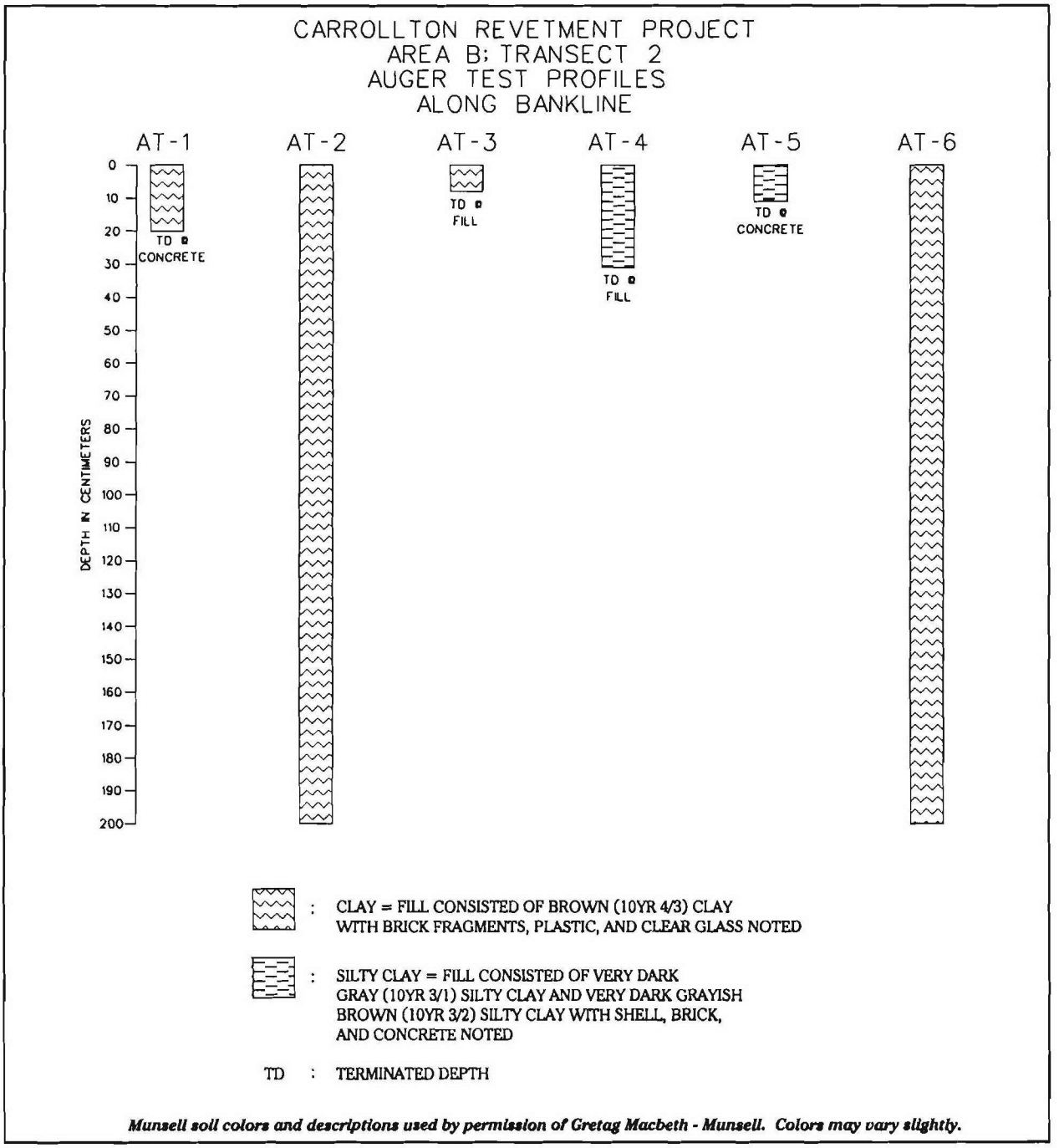


Figure 218. Schematic representation of auger test profiles excavated on the bankline of Area B, Bisso Towboat Company.

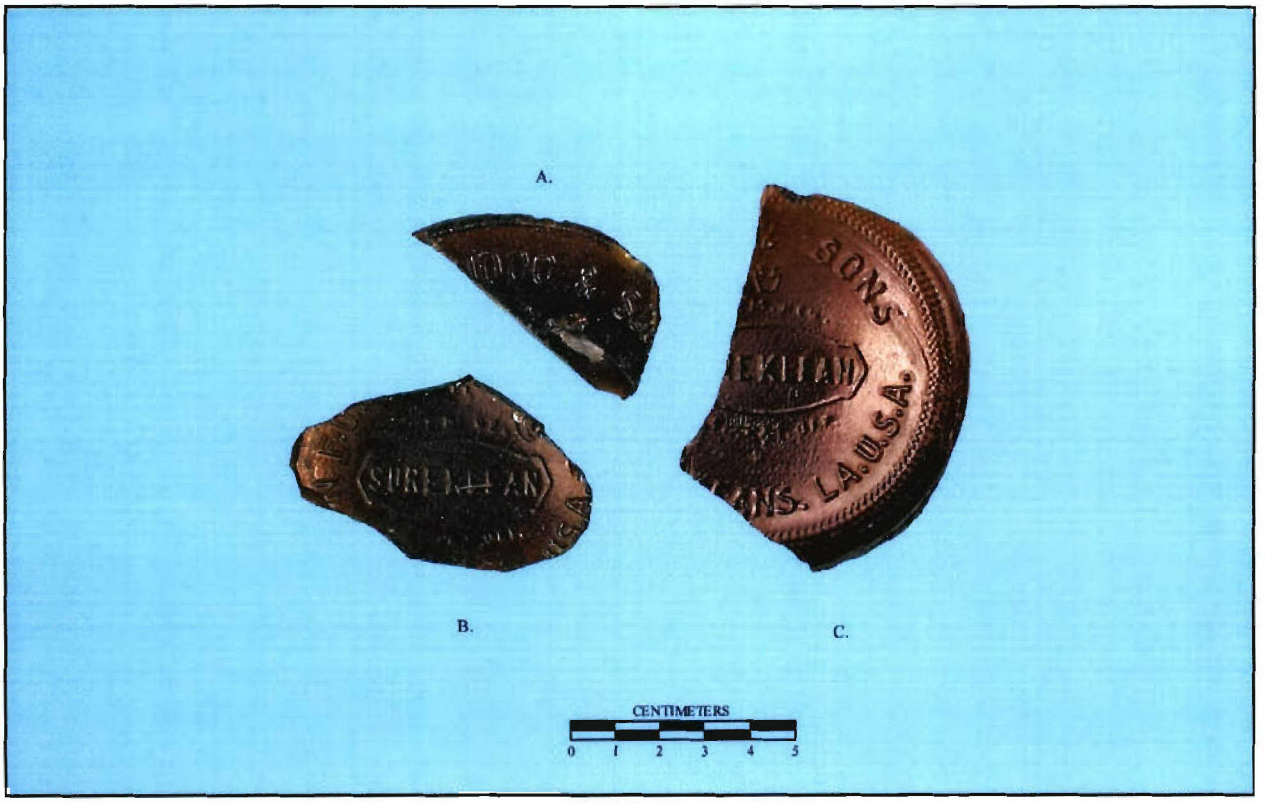


Figure 219. SureKlean Bleach bottle bases manufactured by F. Uddo and Sons of New Orleans recovered during surface collection at Carrollton Bend: a) FS# 15, embossed "...UDDO & SO..."; b) FS# 15, embossed "F. UD.../ SUREKLEAN/ U.S.A.; and c) FS# 03, embossed "& SONS/ ...REKLEAN/ ...LEANS, LA. U.S.A."

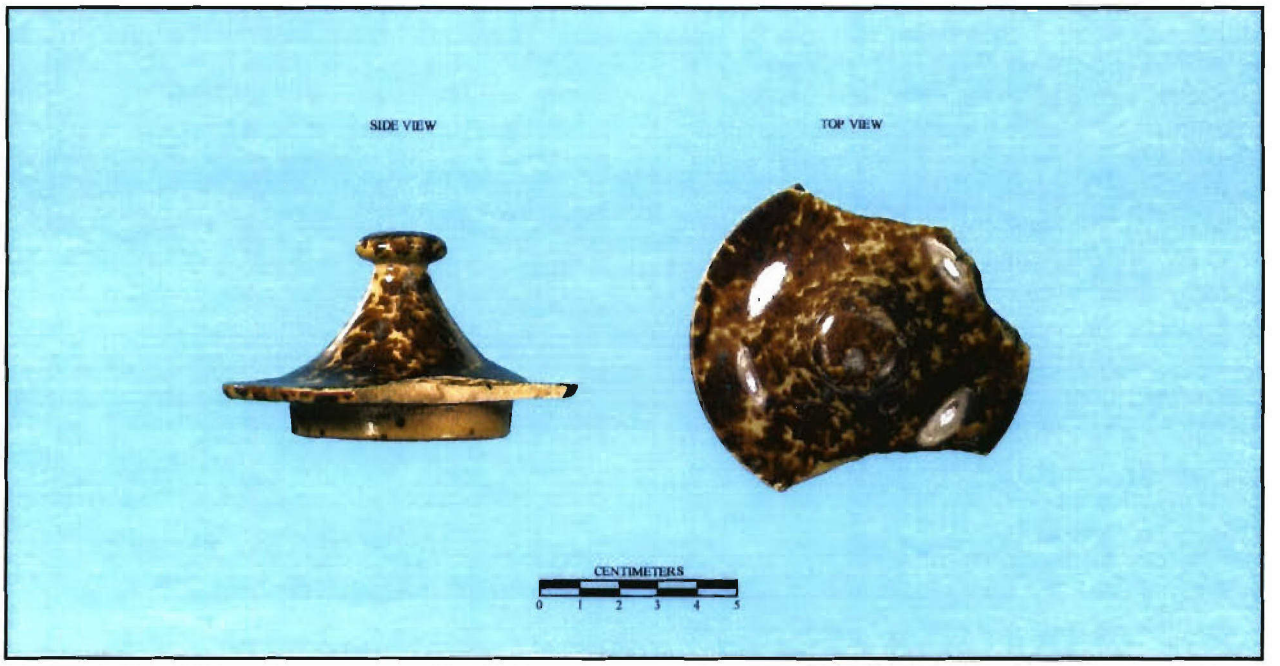


Figure 220. **Side and top view or a Rockingham decorated yellow-ware sherd (FS# 14) recovered during surface collection at Carrollton Bend.**

Summary of Area B

Excavations in Area B documented only artificial fill deposits on the bankline and the lower shoreline. Trench excavation documented fill beginning at the ground surface (approximately 6.27 m [20.59 ft] NGVD) and extending to a depth of 2.2 m (7.2 ft) below surface. Furthermore, auger tests positioned on the shoreline at an approximate elevation of 1.96 m (6.44 ft) NGVD, extended to maximum depth of 1.9 mbs (6.2 ftbs). Thus, considering the difference in elevation between the batture bankline and the shoreline (i.e., approximately 4.31 m [14.15 ft]), over 5.81 m (19.1 ft) of fill is present within Area B.

While cultural material was collected during the examination of Area B, this artifact assemblage reflected the highly disturbed nature of the fill deposits present in the area; the artifacts ranged in date from 1805 to the present day. No intact natural soil deposits were encountered during subsurface investigations at Area B. Likewise, no evidence of intact cultural deposits or historic standing structures was identified; however, an abandoned iron walkway that leads to a boat dolphin, and a twentieth century railroad spur and train engine, were noted on the property. The walkway was built in the late 1980s and is no longer in use. The railroad segment and train engine are situated outside the limits of the Area of Potential Effect, and as such only were noted as part of this investigation. No additional fieldwork is recommended for Area B.

Area C (E.N. Bisso and Son, Inc.)

Situated north of Area B, the E.N. Bisso and Son, Inc. property was designated Area C. The project area lies within the batture of the Mississippi River on the eastern bank. The Area of Potential Effect for this property measured approximately 150 m (492 ft) length, while the width of the project area ranged from 10 to 18 m (32.8 to 59 ft). Area C encompassed approximately 0.2 ha (0.52 ac) of land (Figure 221). The batture, or bankline, of this property consisted of a level, gravel parking area/workspace with an associated metal ramp that lead to a boat dock (Figure 222). The remaining project area was composed of the shoreline of the Mississippi River. Scattered debris and riprap has been deposited along this area; thus, approximately only 105 m (344.5 ft) of the total 150 m (492 ft) long area could not be surveyed due to the amount of cement positioned within this area (Figure 223).

Figure 224 indicates a fairly level batture, equal in height to the crown of the levee; this confirms the addition of a maximum of 2.4 m (8 ft) of fill in the project vicinity. There was a difference of approximately 3.7 m (12 ft) in the elevation between the batture (6.1 m [20 ft] NGVD) and the shoreline (2.4 m [7.9 ft] NGVD) within Area C. The riverbank is depicted here with a sharp decline of 33.5 m (110 ft) in only 110 m (361 ft), versus the gradual slopes seen in the profiles for Areas A and B, implying massive erosion and degradation of the bankline.

Auger Testing

Due to the narrow survey corridor found along this portion of the batture, the steep decline of the bankline, the presence of several buried utilities (i.e., an electrical line, drain pipes, etc.), and a couple of "deadmen" used for tying up barges to the bank, no backhoe trenches were excavated on this property. Therefore, auger testing was conducted along two linear and parallel survey transects. Fieldwork included the successful excavation of 17 of 18 (94 percent) planned auger tests. A single auger test was not excavated because it fell in an area of standing water. The survey transects were oriented north/south and generally followed the shoreline of the Mississippi River. Due to the nature of the project area, a single survey transect (TR 1) was situated along the lower shoreline; the second transect (TR 2) was positioned on the upper bankline. Auger tests were spaced at 15 m (49.2 ft) intervals along each survey transect.

The shoreline, which was exposed approximately 3.7 m (12 ft) below the bank of the batture, exhibited areas completely covered by riprap, metal, and river-deposited debris. It allowed for the excavation of 6 of 7 (85 percent) auger tests along Transect 1. A single auger test (Transect 1/Auger Test 4) was not excavated because it fell in an area covered by standing water. Of the remaining 6 auger tests (Transect 1/Auger Tests 1-3 and 5-7), approximately 83.3 percent did not exceed a depth of 50 cmbs (19.7 inbs) when gravel or buried cement was

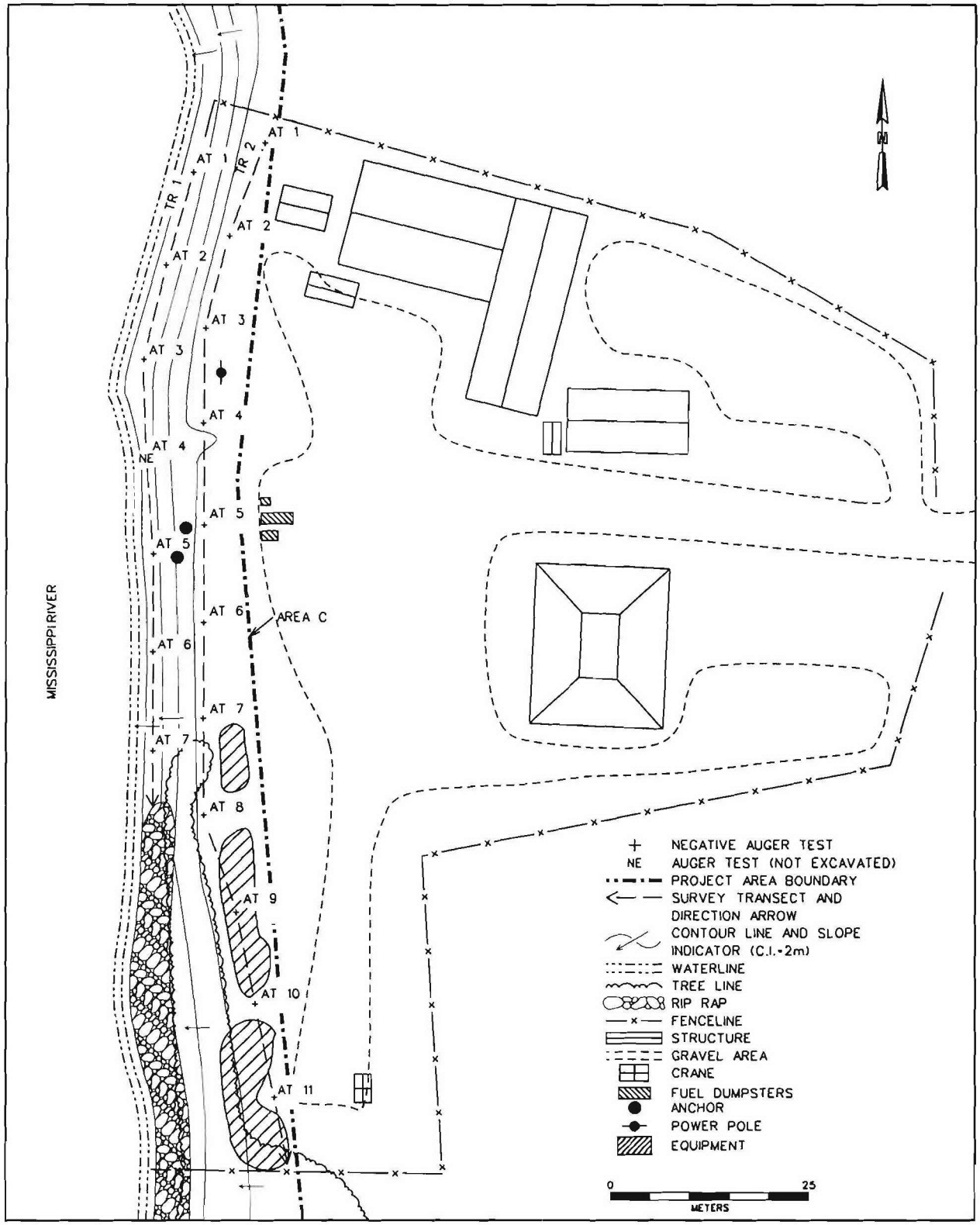


Figure 221. **Plan view of Area C depicting the locations of auger tests.**



Figure 222. Overview photo of batture portion of Area C, facing northwest.



Figure 223. Overview photo of shore portion of Area C, facing north.

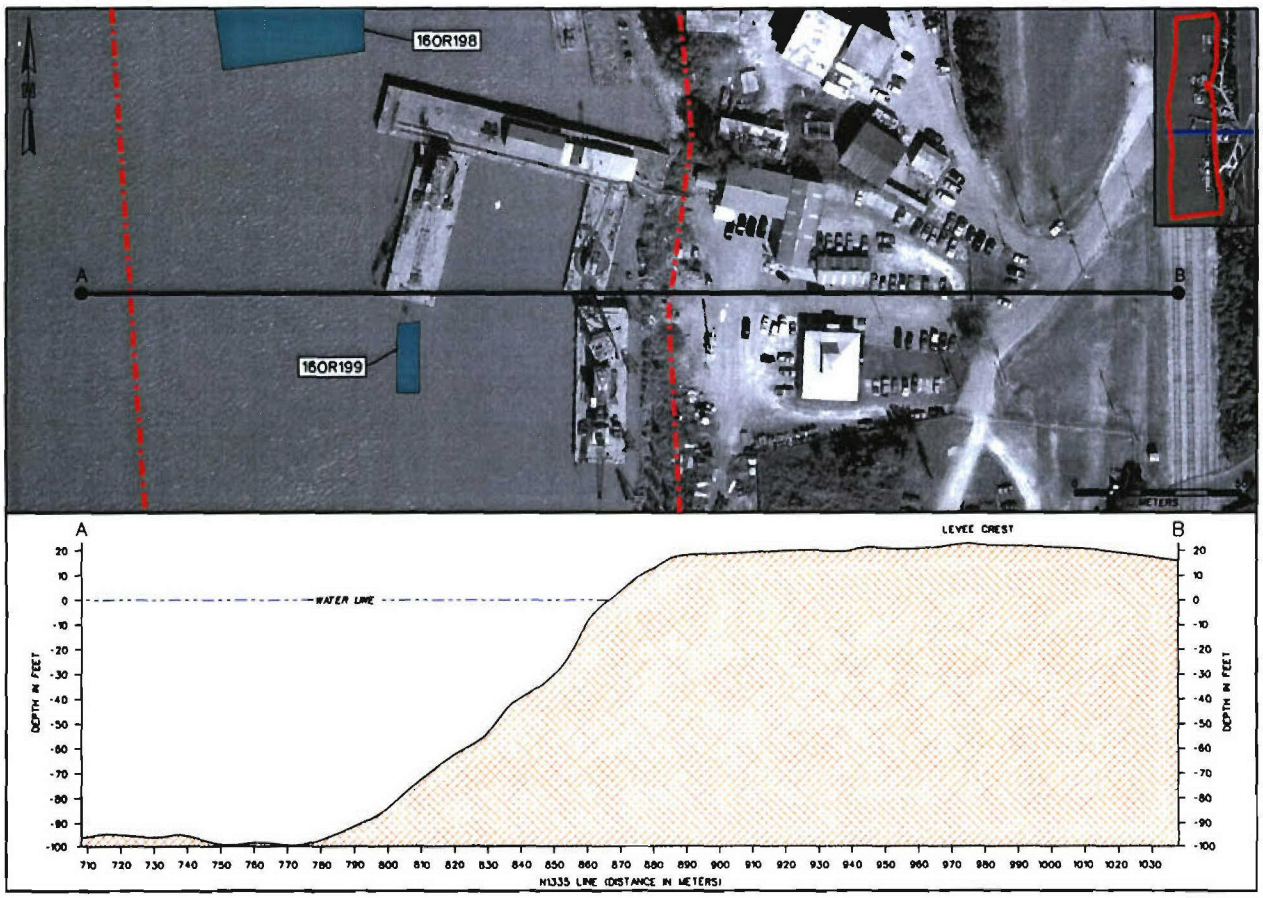


Figure 224. Topographic profile of the N1335 line depicting the project area in the vicinity of Area C.

encountered and hindered the attempt (Figure 225). Fill from the auger tests on this transect comprised predominantly dark brown (10YR 3/3) and dark gray (10YR 4/1) sandy clays; auger tests were terminated due to the presence of tire rubber and concrete.

A single auger test (Transect 1/Auger Test 5) completed along the shoreline was excavated to a maximum depth of 80 cmbs (31.49 inbs); it exhibited two strata in profile (Figure 226). Stratum I was characterized as olive brown (2.5YR 4/3) sandy clay that ranged in depth from 0 to 30 cmbs (11.81 inbs). Stratum II was described as a deposit of olive brown (2.5Y 4/3) sandy clay mottled with dark gray (10YR 4/1) sandy clay; it extended from 30 to 80 cmbs (11.81 to 31.49 inbs), when it was terminated due to the presence of a large piece of rubber at the bottom of the auger test. No cultural material was recovered during the excavation of the auger tests situated along the shoreline. However, concrete, metal, and tires were noted in the field.

A total of 11 of 11 planned auger tests (100 percent) were successfully excavated along Transect 2, which was positioned along the batture portion of Area C. None of these excavated auger tests (i.e., Transect 2/Auger Tests 1 through 11) could be excavated beyond a depth of 30 cmbs (11.8 inbs). In fact, approximately 82 percent (n=9) did not exceed a depth of 15 cmbs (5.9 inbs) before gravel or buried cement was encountered and forestalled the endeavor (Figure 227). Fill material on this transect generally was characterized as a deposit of dark yellowish brown (10YR 4/4) and dark brown (10YR 3/3) clayey sand with gravel and concrete noted.

A single auger test (Transect 2/Auger Test 6) was excavated to a depth of 30 cmbs (11.8 inbs) before it was terminated; it exhibited three strata in profile (Figure 228). Stratum I extended from the ground surface to 15 cmbs (5.9 inbs) and was characterized as a deposit of dark yellowish brown (10YR 4/4) clayey sand. It was underlain by Stratum II, a deposit of brown (10YR 4/3) sandy clay that reached from 15 to 20 cmbs (5.9 to 7.9 inbs). The final excavated stratum (Stratum III) was represented by a layer of dark yellowish brown (10YR 4/4) clay silt that ranged from the base of Stratum II to a terminated depth of 30 cmbs (11.8 inbs); gravel was encountered at the base of this auger test. These thin lenses indicate several episodes of depositing fill throughout the project area. No cultural material was recovered during the excavation of the auger tests situated on the batture.

Summary of Area C

Despite the truncated nature of the auger tests excavated along both the bank and shore within Area C, this Phase I cultural resources investigation documented that the examined portions of the Area of Potential Effect contained artificial fill deposits. Auger testing documented fill beginning at the ground surface (approximately 6.1 m [20 ft] NGVD) and extending to a depth of 0.3 m (0.98 ft) below surface. Furthermore, auger tests positioned on the shoreline at an approximate elevation of 2.4 m (7.9 ft) NGVD, extended to maximum depth of 0.8 mbs (2.6 ftbs). Thus, considering the difference in elevation between the batture bankline and the shoreline (i.e., approximately 3.7 m [12.1 ft]), over 4.5 m (14.8 ft) of fill is present within Area C. Personnel from E.N. Bisso and Son, i.e., the property owners, confirmed that the Area of Potential Effect contained extensive fill deposits (William Summers, personal communication: August 4, 2003). Based on the results of this Phase I cultural resources survey of Area C, no intact cultural or stratigraphic deposits were encountered. Furthermore, no cultural material was recovered during the examination of this project area.

Area D (Bisso Marine Inc.)

Area D was located within the property owned and operated by Bisso Marine Inc. It was situated north of E.N. Bisso and Son, Inc. (Area C). Bisso Marine Inc., was the largest property examined as part of this Phase I cultural resources survey within the Greenville area of the Mississippi River levee batture. This project area measured approximately 387.5 m (1271.3 ft) in length, while the width of the project area ranged from 10 to 23 m (32.8 to 75.5 ft); it encompassed approximately 0.64 ha (1.6 ac) of land (Figure 229).

The batture, or bankline, of this property consisted of a graveled access road and workspaces; concentrations of marine platforms, cranes, and other heavy equipment related to the marine salvage operations of the owners; and

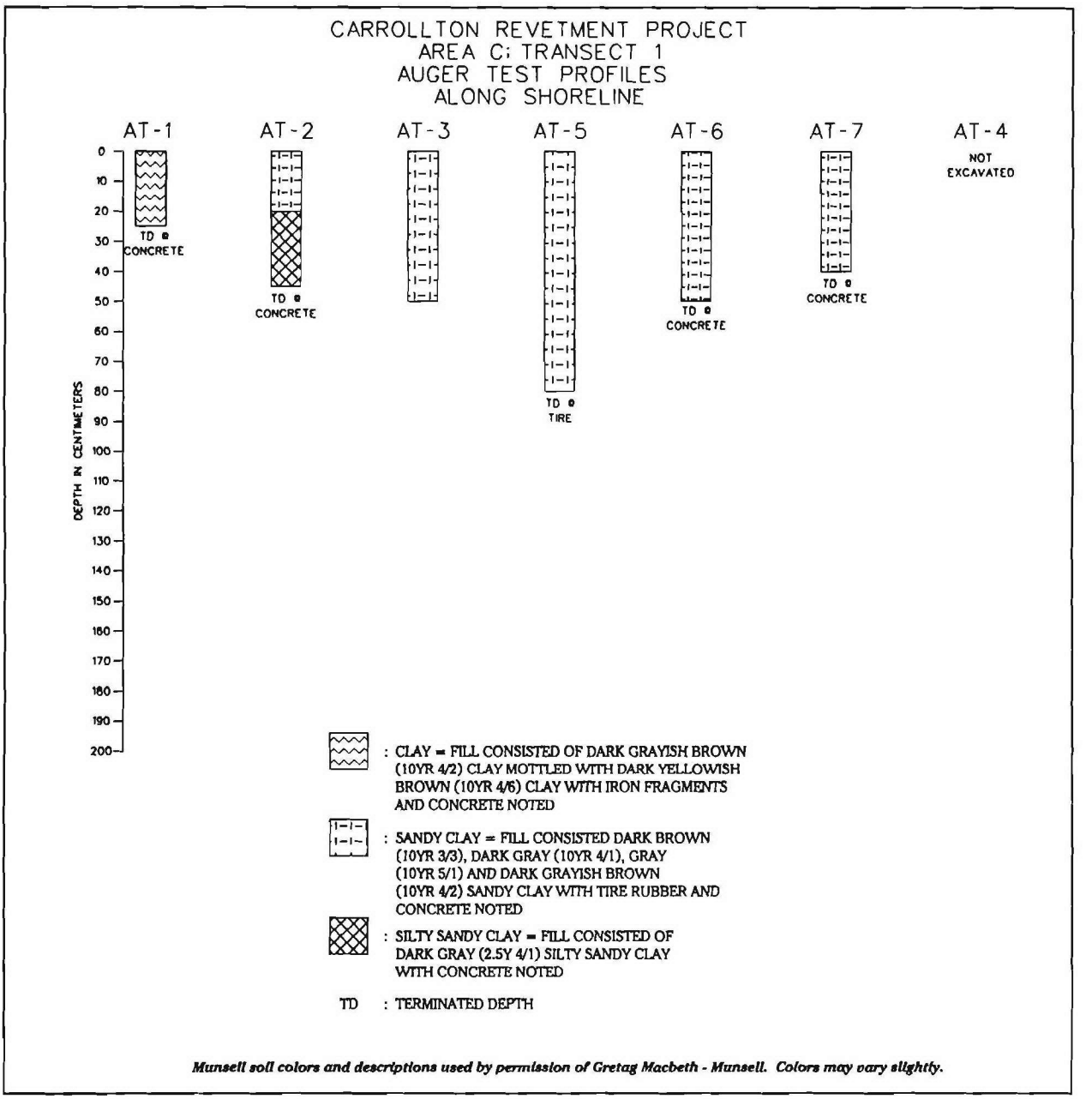


Figure 225. Schematic representation of auger test profiles excavated on the shoreline of Area C, E.N. Bisso and Son, Inc.

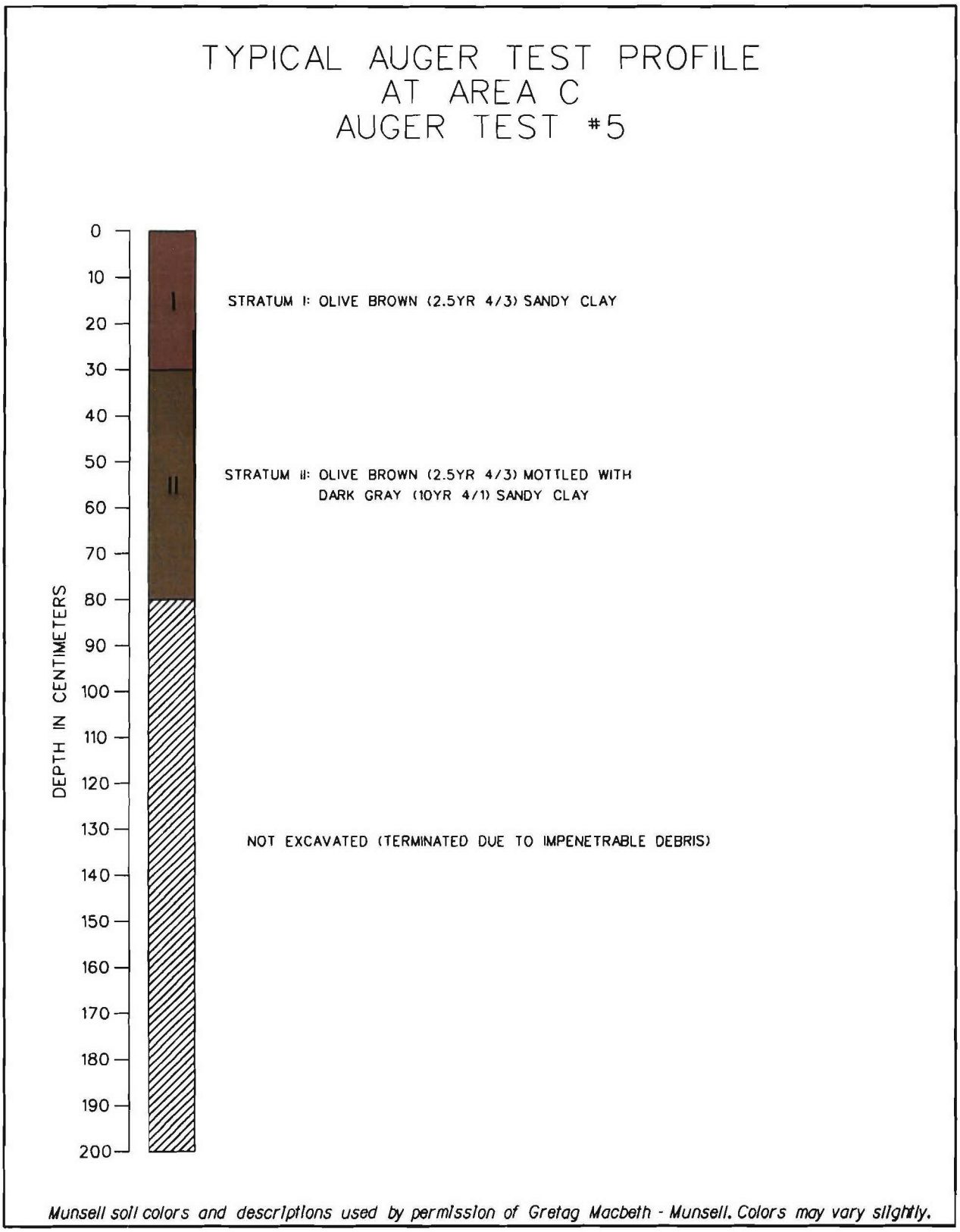


Figure 226. Profile of Auger Test 5 from Transect 1 within Area C.

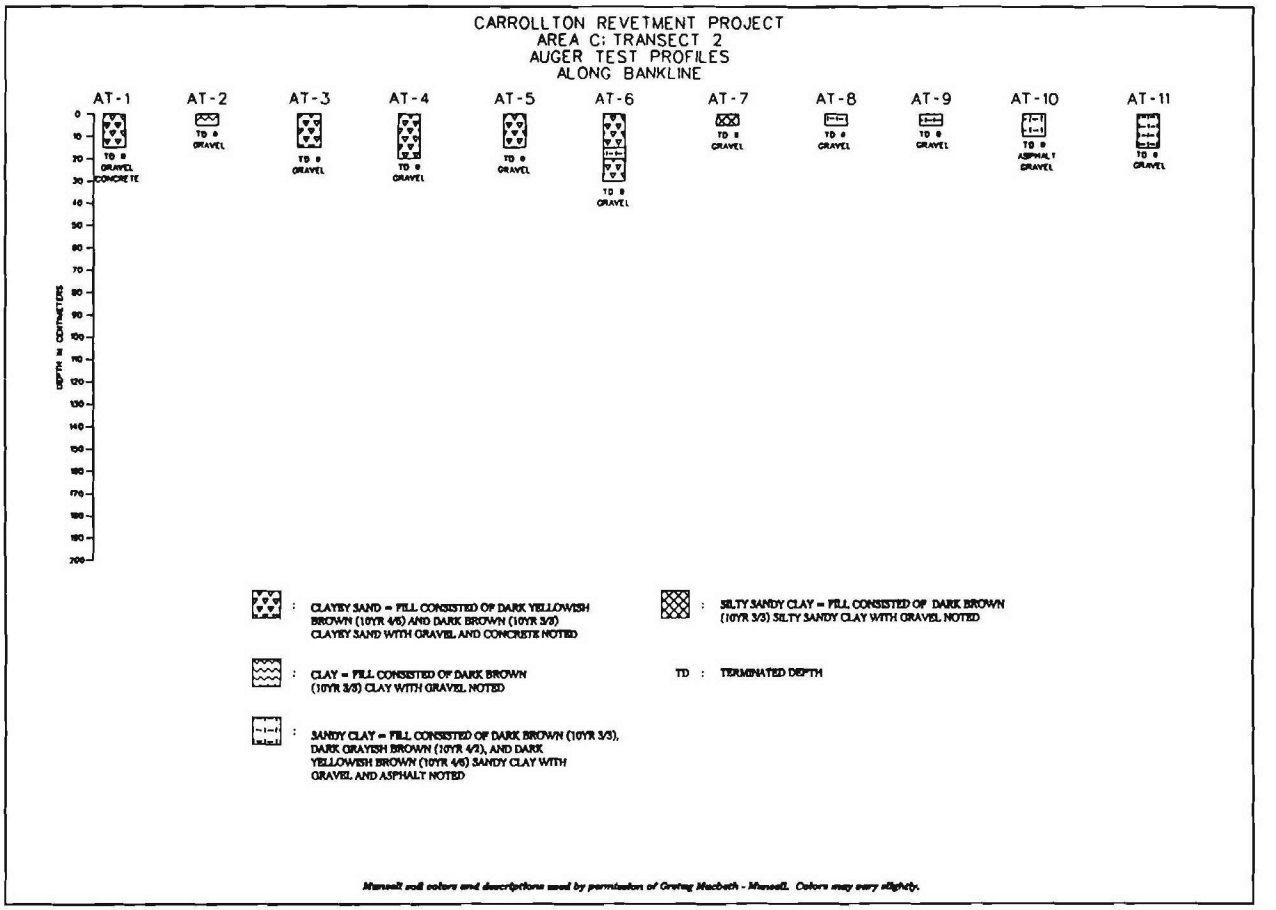


Figure 227. Schematic representation of auger test profiles excavated on the bankline of Area C, E.N. Bisso and Son, Inc.

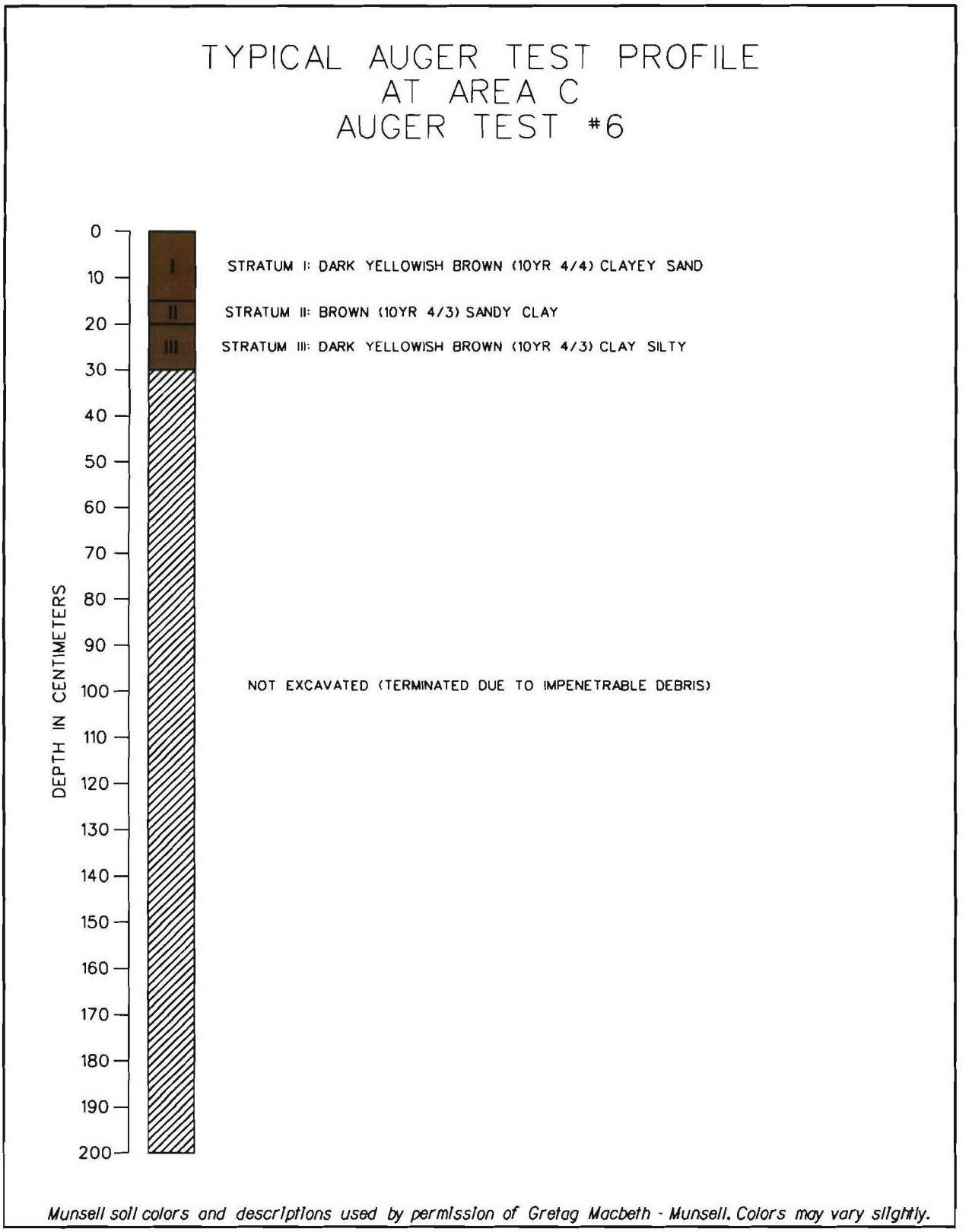


Figure 228. Profile of Auger Test 6 from Transect 1 within Area C.

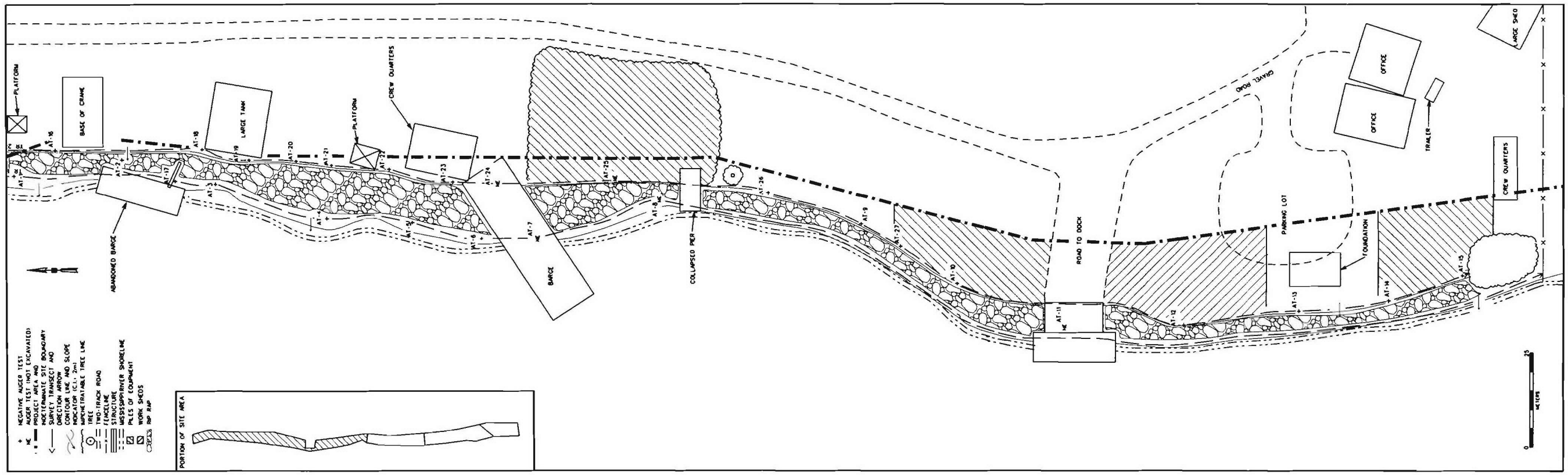


Figure 229. Plan view of Area D depicting the locations of auger tests.

patches of thick secondary growth (Figures 230 and 231). Elevation along the bankline within the Area of Potential Effect ranged from 3.4 to 5.8 m (11.2 to 10 ft) NGVD. The remaining portion of the project area included the shoreline of the Mississippi River. Scattered debris and riprap has been deposited within sections of this area; thus, the area could not be surveyed. This restricted area encompassed approximately 262.5 m (861.2 ft) of the total length of the project item along the shore (Figures 232 and 233).

Elevation along the shoreline within Area D ranged from 1.5 to 2.7 m (4.9 to 8.9 ft) NGVD. Thus, there is an average difference of 3.4 m (11.2 ft) in the elevation between the batture bankline (avg. 5.34 m [17.5 ft] NGVD) and the shoreline (avg. 1.96 m [6.5 ft] NGVD) within Area D. This difference also can be seen in a series of topographic profiles that were completed at the southern end of the area (Figure 234), within the central portion of the area (Figure 235), and at the northern end of the Area of Potential Effect (Figure 236). Figure 234 depicts a steeply cut riverbank that is protected to a minor extent by the remains of Shipwreck #7 (Site 16OR195). This contrasts with the slightly more gradual slopes recorded in the remainder of Area D (Figures 235 and 236), and may indicate an eddy within the river that scours the southern riverbank more then the northern portion. Certainly the shipwrecks contribute to erosion within the project area. Furthermore, these profiles indicated that lesser amounts of fill were deposited throughout the batture area; the crown of the levee is approximately 1.8 m (6 ft) higher than the ground surface.

Auger Testing

Due to the narrow survey corridor along the batture, the steep decline of the bankline, the presence of heavy equipment, and thick vegetation, no backhoe trenches were excavated on this property. Therefore, the Phase I cultural resources survey and archeological inventory of Area D was conducted using two linear and parallel survey transects, which guided the successful excavation of 22 of 27 (81.5 percent) planned auger tests. A total of 5 auger tests were not excavated because they fell in areas composed of riprap, and/or abandoned barges and other equipment. The survey transects were oriented north/south, and they generally followed the shoreline of the Mississippi River. Due to the nature of the project area, a single survey transect (TR 1) was situated along the lower shoreline; the second transect (TR 2) was positioned on the upper bankline. Auger tests were spaced at 10 to 30 m (32.8 to 98.4 ft) intervals along the shore of the Mississippi River; distances between auger tests varied due to the presence of scrap metal, riprap, and other inaccessible areas.

Shoreline

As mentioned above, the shoreline portion of this project parcel was characterized by riprap, areas of debris deposited by the river, a dock facility, two barges, as well as scattered patches of impassable vegetation (Figures 237 and 238). Visual reconnaissance of this area resulted in the recovery of 39 artifacts (Table 21). This artifact assemblage consisted of a single bakelite handle to a Sunbeam™ iron (1940 to 1960), 3 indeterminate bricks, 1 2-hole plastic button, 1 porcelain electrical insulator, 1 possible Fiesta ware plate fragment (1936 to present), 2 hand-painted whiteware plate fragments (1820 to present), 1 undecorated porcelain plate fragment, 1 undecorated porcelain lid fragment, 1 yellow-glazed whiteware plate fragment, 1 rim sherd of an edge-decorated whiteware plate, 1 transfer-printed ironstone plate sherd, 1 undecorated ironstone plate sherd, 1 sherd of an undecorated ironstone saucer, 1 undecorated whiteware plate rim (1820 to present), 1 fragment of a ceramic sewer pipe, 2 wire iron nails (1890 to present), 1 indeterminate iron object, 3 amber bottle glass shards (1904 to 1969), 1 embossed window glass shard, 1 small milk glass jar (1903 to present), 1 clear glass bottle that dated from 1903 to present, 1 clear glass bottle that dated from 1929 to 1954, 1 clear flat glass shard, 1 indeterminate clear glass shard, 3 clear container glass shards, 2 green glass bottle shards (1904 to 1969), 1 red-stained glass shard, 1 rim shard of a solarized glass jar (1875 to 1920), 1 piece of a metal watchband, and 1 stainless steel spoon fragment.

The presence of these items along the shoreline could be indicative of river debris deposited during flooding or high tide. It also is possible that these items were brought in with the artificial fill used to stabilize the batture. Al-



Figure 230. **Overview photo of batture portion of Area D, facing south.**



Figure 231. Overview photo of batture portion of Area D, facing west.



Figure 232. **Overview photo of shore portion of Area D, facing south.**



Figure 233. Overview photo of shore portion of Area D, facing south.

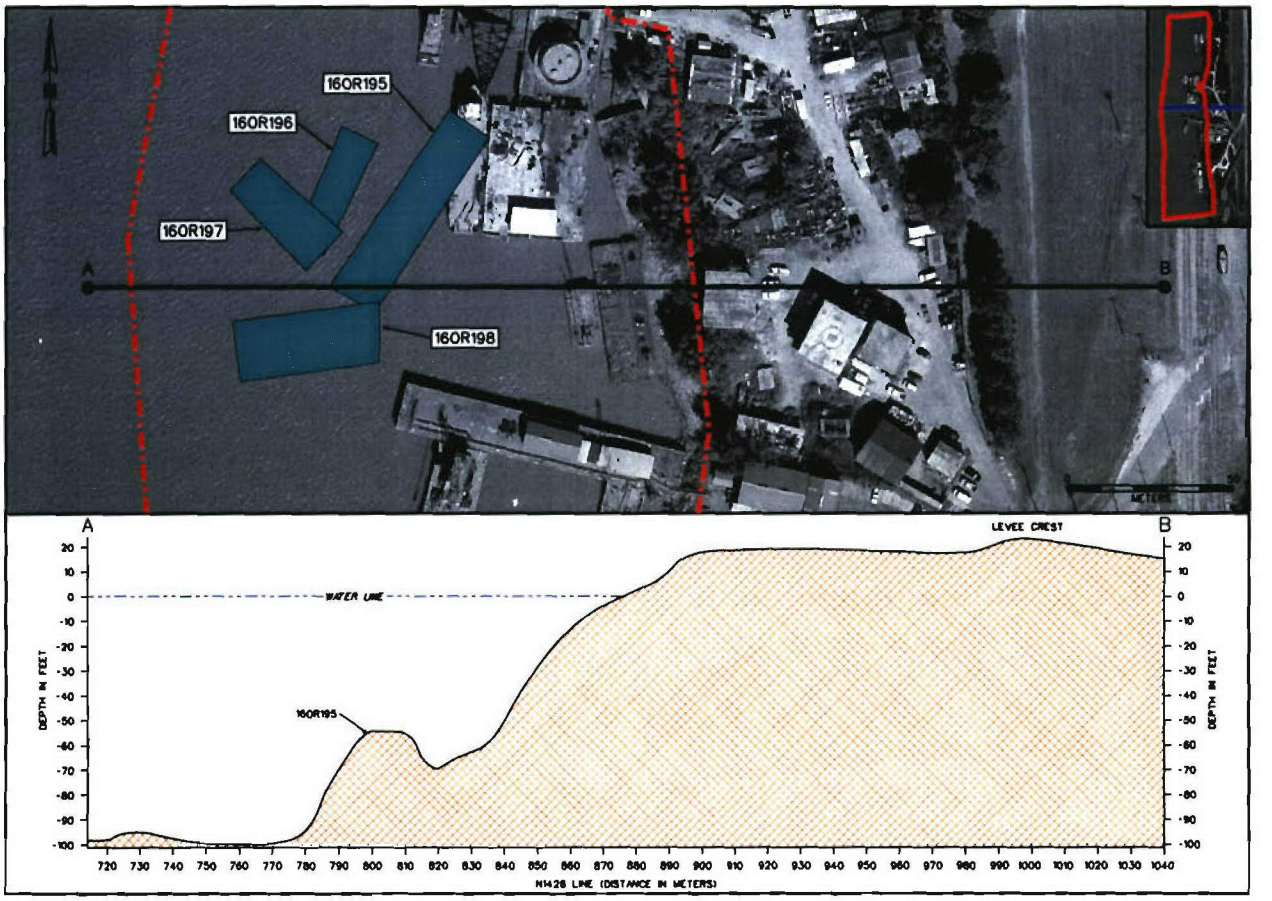


Figure 234. **Topographic profile of the N1426 line depicting the project area in the vicinity of the southern end of Area D.**

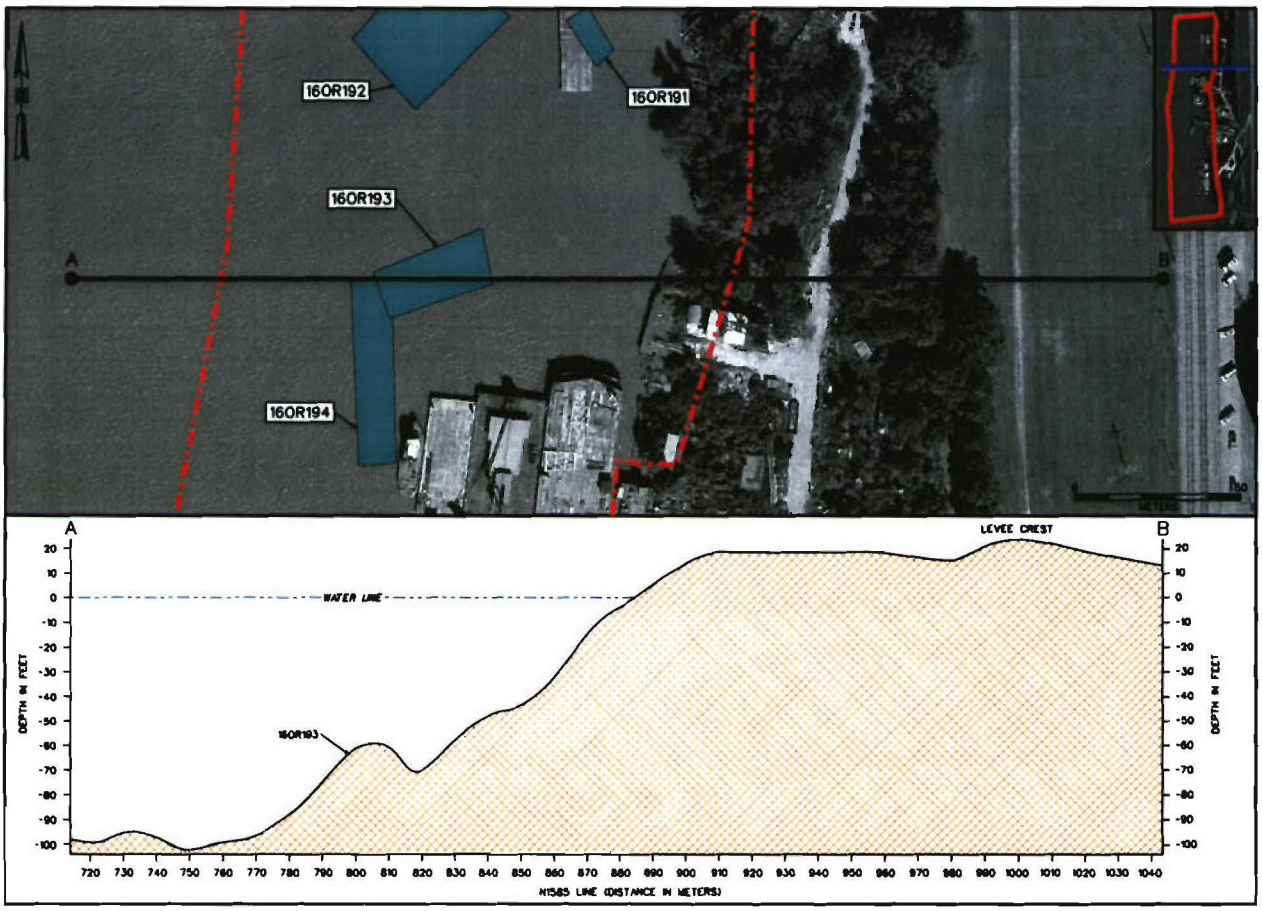


Figure 235. **Topographic profile of the N1585 line depicting the project area in the vicinity of the central portion of Area D.**

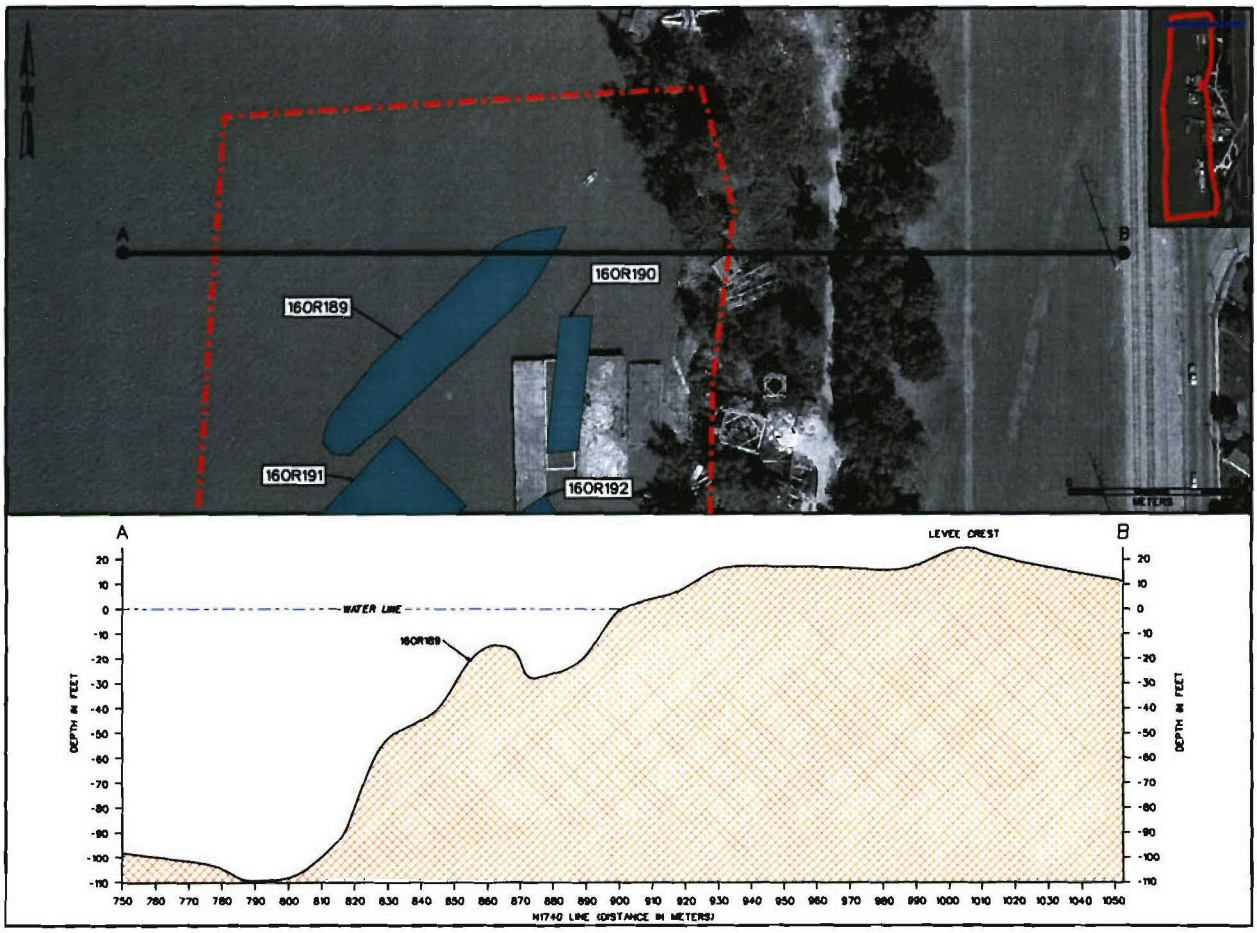


Figure 236. **Topographic profile of the N1740 line depicting the project area in the vicinity of the northern end of Area D.**



Figure 237. Photograph of barge located in western portion of Area D.

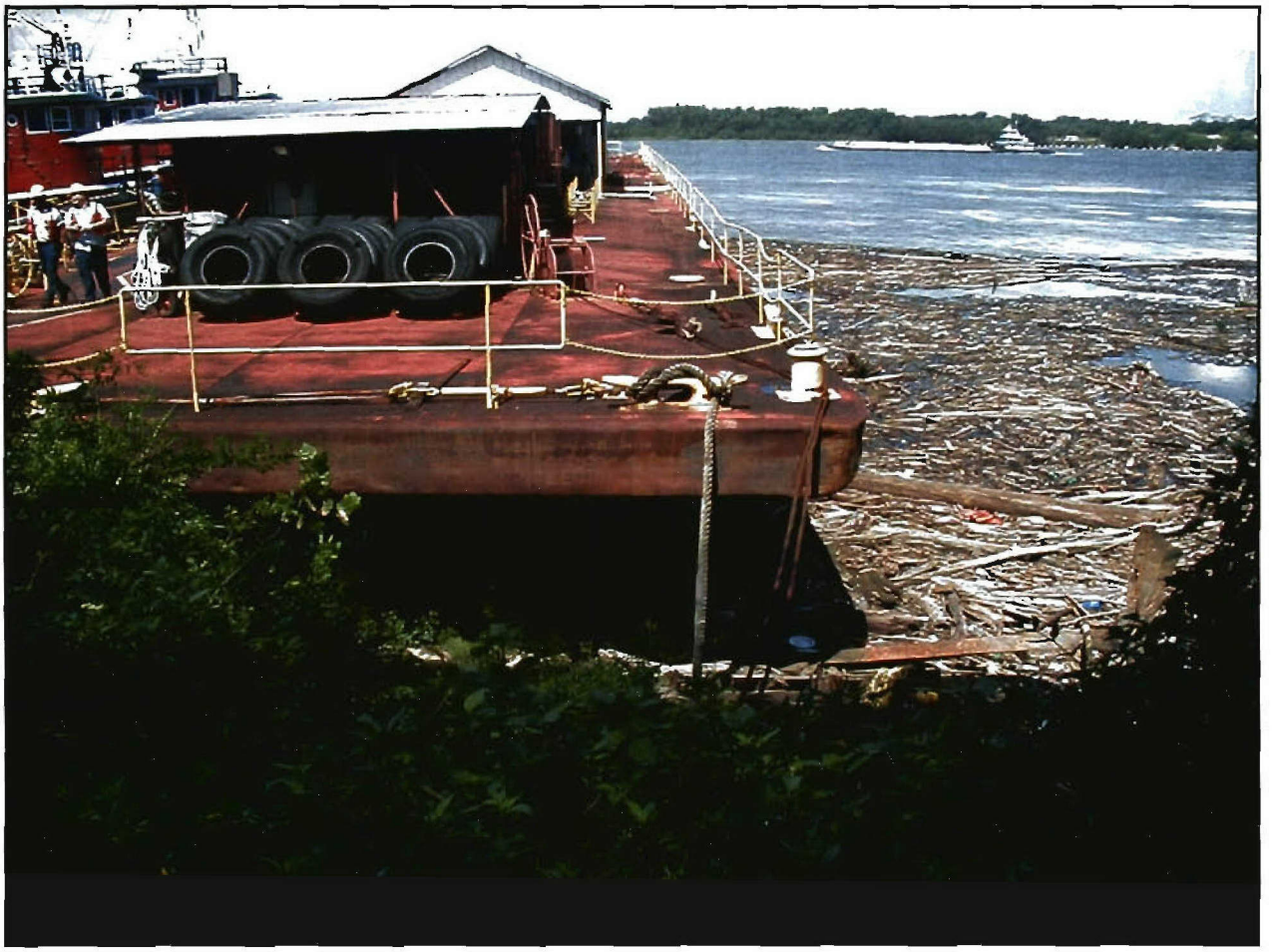


Figure 238. Photograph of floating barge located in central portion of Area D.

Table 21. Cultural material recovered from Area D.

Provenance	Material	Function	Type	Subtype	Possible Date	Total
Bank - Surface	brick	architectural	stiff mud	indeterminate		1
	ceramic	architectural	cement	block		1
Bank Total						**2**
Shore - Surface	bakelite	household tools/ implements	Sunbeam Ironmaster	clothing iron	1940-1960	1
	brick	architectural	indeterminate	indeterminate		2
			stiff mud	indeterminate		1
	ceramic	architectural	hard-paste porcelain	insulator		1
			redware	pipe		1
		food consumption	hard-paste porcelain	undecorated		1
			ironstone	undecorated	1840-present	1
					1901-present	1
				Fiesta ware	1936-present	1
			whiteware	yellow-glaze	1820-present	1
				hand-painted	1820-present	2
				edge-decorated	1820-1850	1
		food indeterminate	ironstone	transfer-print	1845-present	1
			whiteware	undecorated	1820-present	1
		indeterminate storage	hard-paste porcelain	undecorated		1
	ferrous	construction hardware	nail	wire	1890-present	2
		indeterminate	lid	indeterminate		1
	glass	architectural	window	opaque		1
		food consumption	bottle	colorless	1903-present	1
			container	tableware		1
		food indeterminate	bottle	beverage	1904-1969	1
			jar	solarized	1875-1920	1
		hygiene	bottle	Sure-Klean bleach	1904-1969	1
		indeterminate	bottle	amber		1
				colorless	1929-1954	1
				green	1903-present	1
			container	amber		1
				yellow		1
			indeterminate	colorless		1
			table glass	clear		1
		indeterminate domestic	curved	colorless		2
		cosmetic/ pharmaceutical	jar	milk glass	1903-present	1
	metal	personal adornment	watchband	male		1
	plastic	personal adornment	Button	2-hole		1
	steel	food consumption	utensil	spoon		1
Shore Total						**39**
Grand Total						**41**

ternatively, these items could be attributed to the domestic dwellings that once existed on the batture. Because these items were found along the shoreline, it also is possible that they could have eroded down from the upper bank. Regardless of the method of their deposition, they do not represent an intact cultural deposit.

The shoreline, which was exposed, on average, 3.4 m (11.2 ft) below the bank of the batture, exhibited areas completely covered by riprap, metal, and river-deposited debris. It allowed for the excavation of 7 of 10 (70 percent) auger tests along Transect 1; 3 auger tests fell within inaccessible and/or unsafe areas that could not be examined. For the remaining 7 auger tests (Transect 1/Auger Tests 1-6 and 17), approximately 57 percent (n=4) did not exceed a depth of 120 cmbs (47.2 inbs) (Figure 239). At this depth, gravel and/or cement were encountered, or the influx of water hindered the excavation process. However, three auger tests (Transect 1/Auger Tests 3, 5, and 17) completed along the shoreline were excavated to a maximum depth of 200 cmbs (78.7 inbs).

The schematic representation of the Area D shoreline auger tests demonstrates the artificial nature of the deposits. Auger Tests 5, 6, and 17 exhibited the mottled soil indicative of fill or disturbance; however, they did not produce cultural material (Figure 239). The remainder of the shoreline auger tests exhibited sediments that ranged from gray (10YR 5/1) clay to dark yellowish brown (10YR 4/6) silty clay with crushed shell, metal fragments, concrete, and charred wood present.

A typical auger test (Transect 1/Auger Test 3) excavated on the northern shoreline of Area D extended to a maximum depth of 200 cmbs (78.74 inbs) (Figure 240). It exhibited three strata in profile, including Stratum I, a deposit of yellowish brown (10YR 5/4) sandy loam mottled with yellowish brown (10YR 6/6) sandy loam that ranged in depth from 0 to 5 cmbs (1.96 inbs). Stratum II was excavated between 5 and 100 cmbs (1.96 and 39.4 inbs) and it was described as layer of brown (10YR 4/3) sandy clay mottled with dark gray (10YR 4/1) sandy clay; small pieces of charred wood also were noted in the field but not collected. Finally, Stratum III was characterized as brown (10YR 4/3) sandy clay mottled with dark gray (10YR 4/1) clay. It extended from 100 to 200 cmbs (39.37 to 78.74 inbs). The presence of water was noted at 100 cmbs (39.37 inbs). No cultural material was identified during the excavation of this auger test.

In the central portion of Area D, auger tests positioned on the shoreline exhibited a slightly different soil pedon. A representative profile in this area was identified at Transect 1/Auger Test 6, which was excavated to a depth of 120 cmbs (47.2 inbs) (Figure 241). Auger Test 6 exhibited two strata in profile. Stratum I consisted of a layer of gray (10YR 5/1) clay mottled with dark yellowish brown (10YR 4/4) clay and it ranged from 0 to 100 cmbs (39.4 inbs). Stratum II was characterized by a deposit of gray (Gley 1 5/N) clay interspersed with organics that extended from the base of Stratum I to a depth of 120 cmbs (47.2 inbs); the influx of water resulted in the termination of the excavation process. Despite meticulous excavation procedures, no cultural material was recovered during the excavation of this auger test.

Batture/Bankline

A total of 15 of 17 planned auger tests (88.2 percent) were successfully excavated along Transect 2 (Transect 2/Auger Tests 9-10, 12-16, 18-23, 26-27), which was positioned along the batture portion of Area D. Of these, 2 auger tests (Transect 2/Auger Tests 24 and 25) were positioned in inaccessible areas and they were not excavated. Only one of the auger tests (i.e., Transect 2/Auger 18) could be excavated to a depth of 200 cmbs (78.7 inbs); the majority (76.4 percent (n=13) did not exceed a depth of 60 cmbs (23.6 inbs) when gravel, buried cement, or water was encountered and forestalled the endeavor. This topsoil varied in degrees from deposits of dark brown (10YR 3/3) clayey sand to brown (10YR 5/3) sand; it often contained *Rangia* shell, gravel, wood, and brick fragments (Figure 242).

Figure 243 depicts the soil pedon recorded from Transect 2/Auger Test 18, which was excavated to a maximum depth of 200 cmbs (78.74 inbs); it exhibited four strata in profile. Stratum I was described as a layer of dark yellowish brown (10YR 4/4) sandy clay that ranged from 0 to 110 cmbs (0 to 43.3 inbs). Stratum II was characterized as brown (10YR 4/3) sandy clay

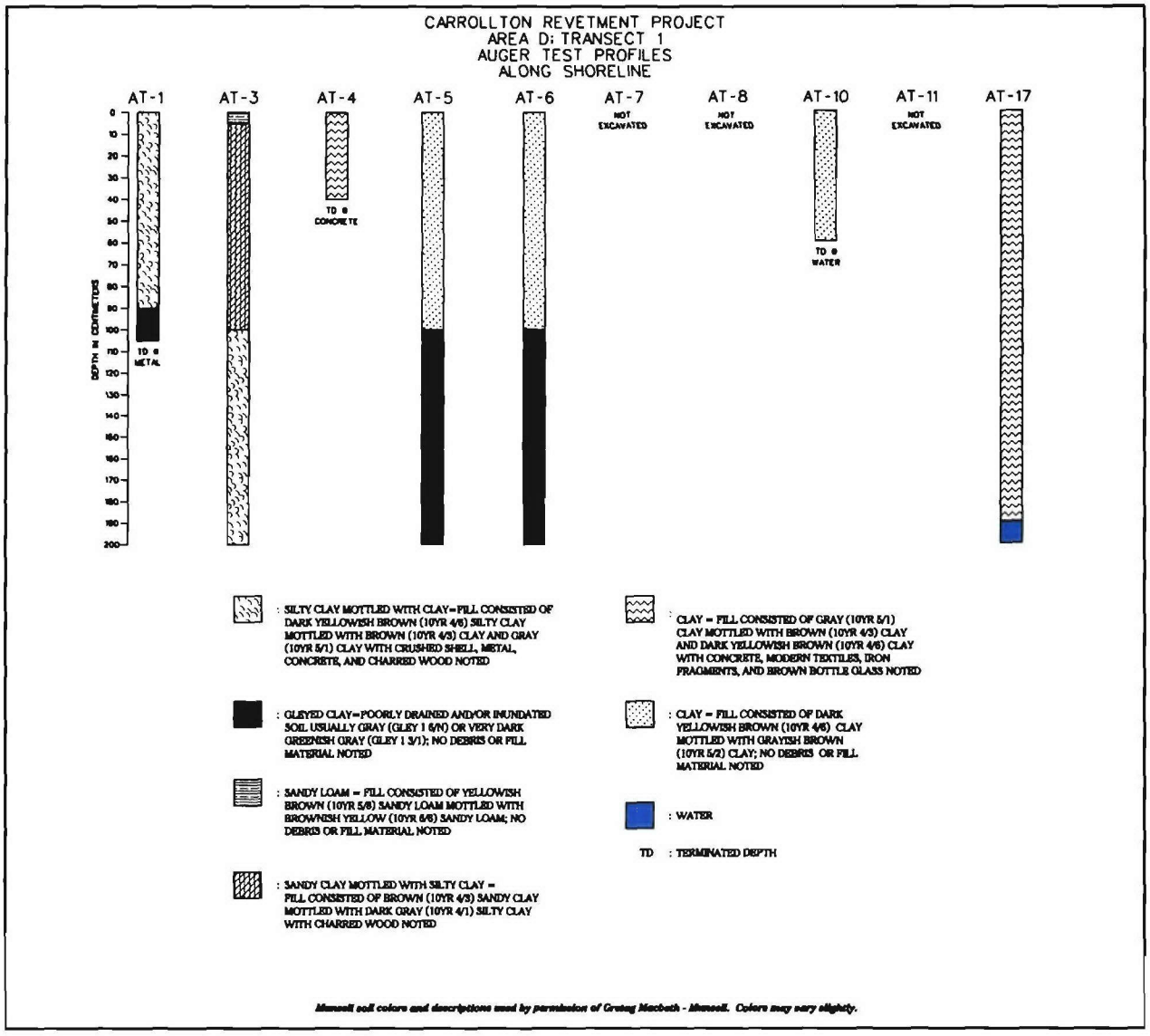


Figure 239. Schematic representation of auger test profiles excavated on the shoreline of Area D, Bisso Marine, Inc.

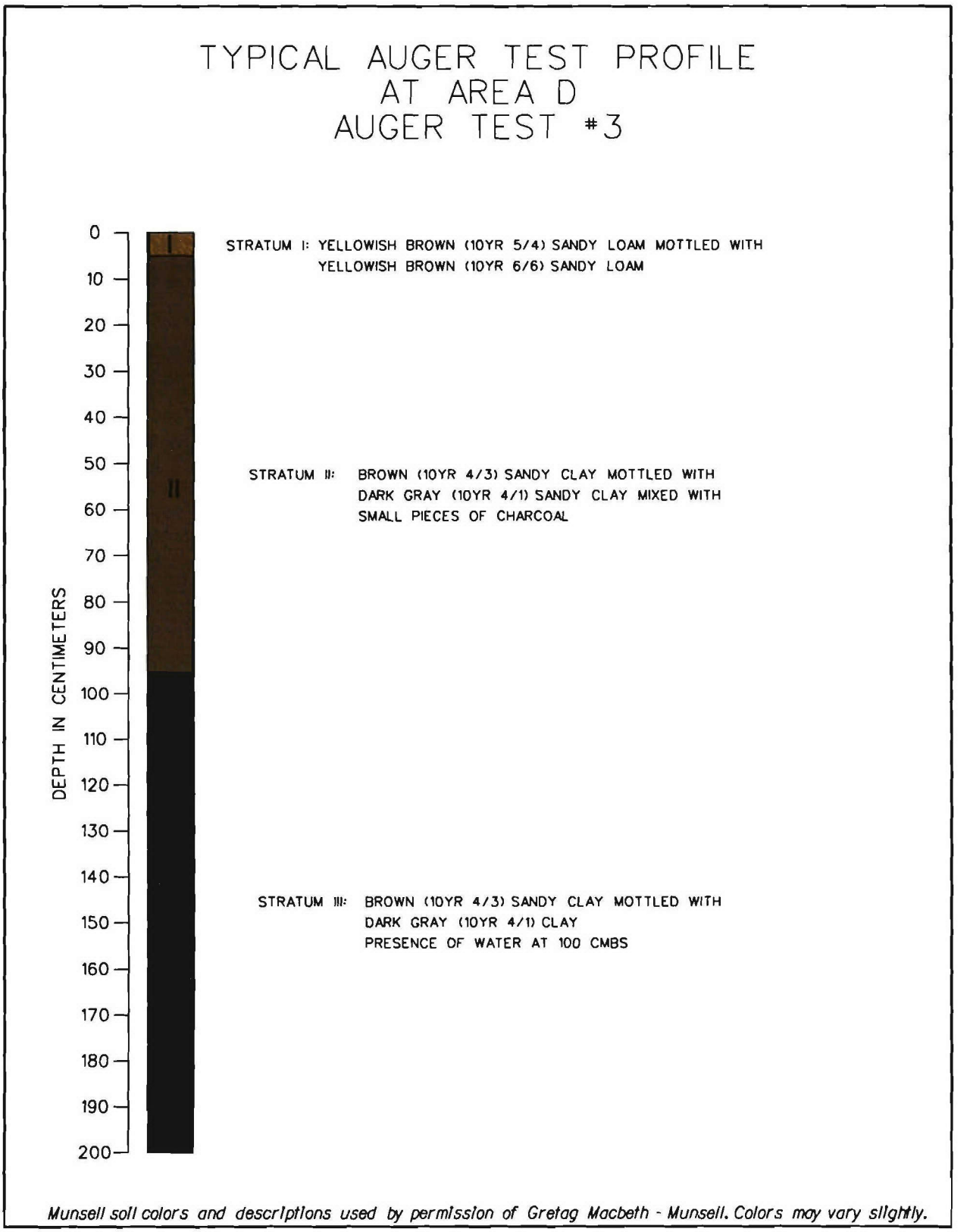


Figure 240. Profile of Auger Test 3 from Transect 1 within Area D.

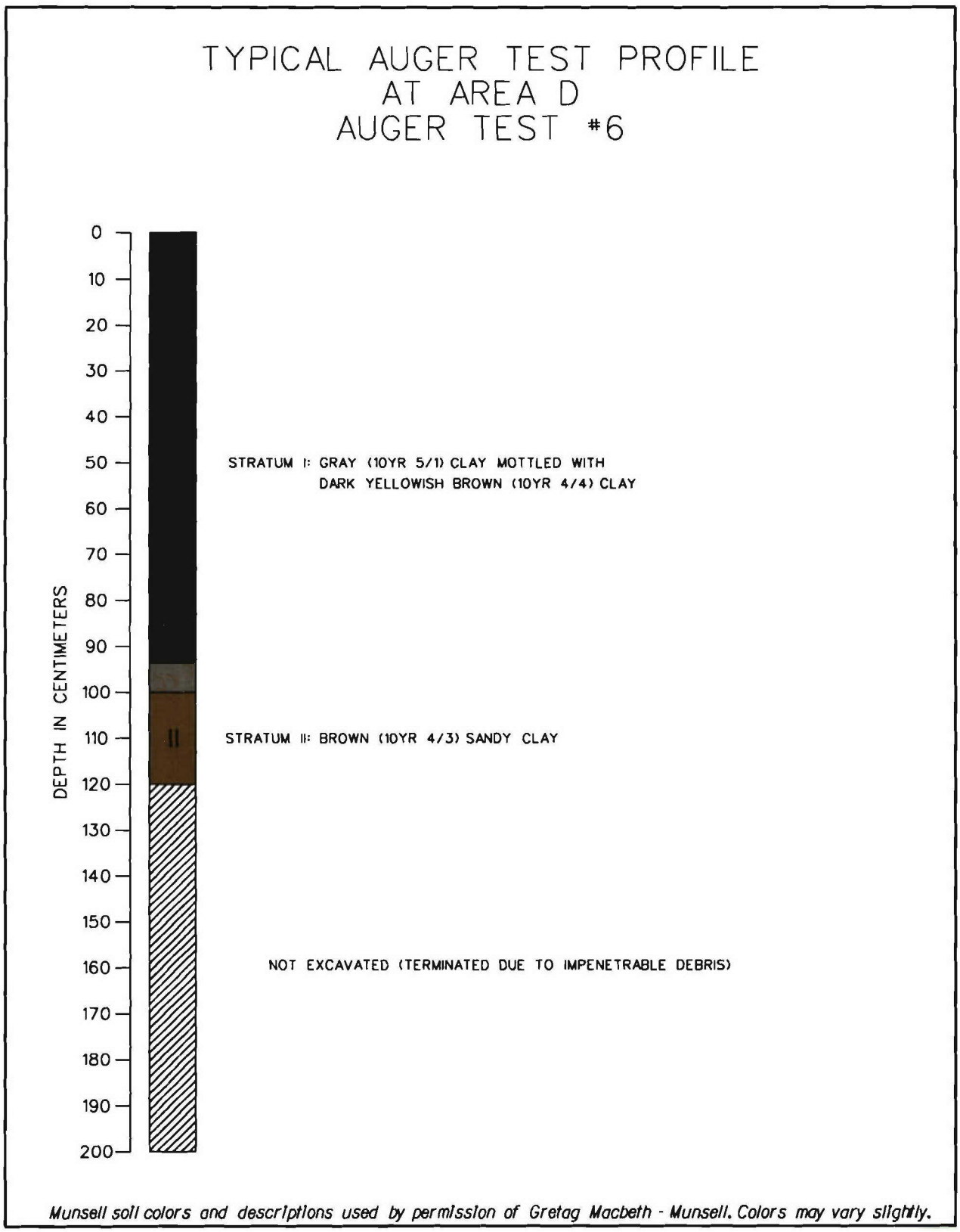


Figure 241. Profile of Auger Test 6 from Transect 1 within Area D.

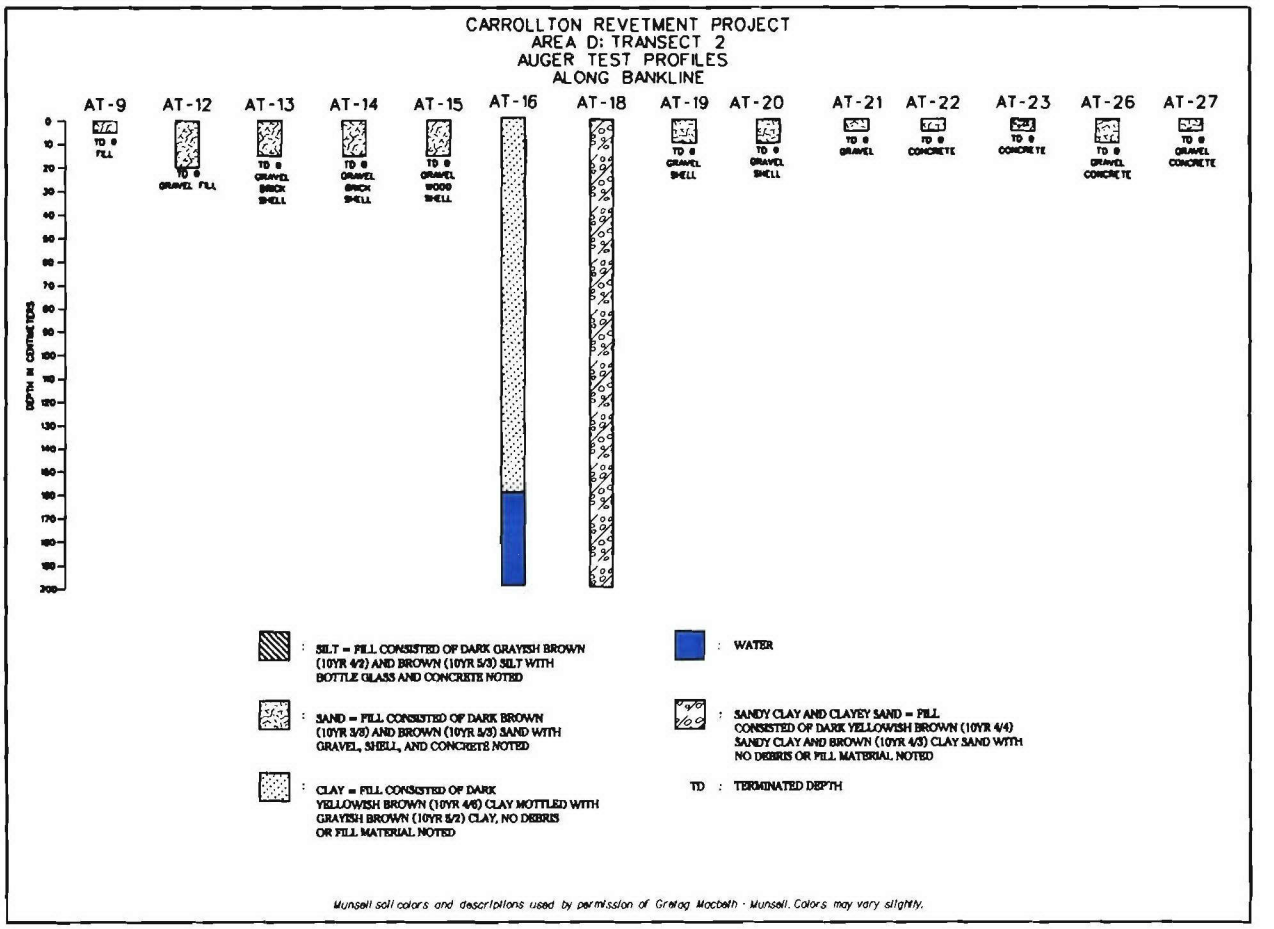


Figure 242. **Schematic representation of auger test profiles excavated on the bankline of Area D, Bisso Marine, Inc.**

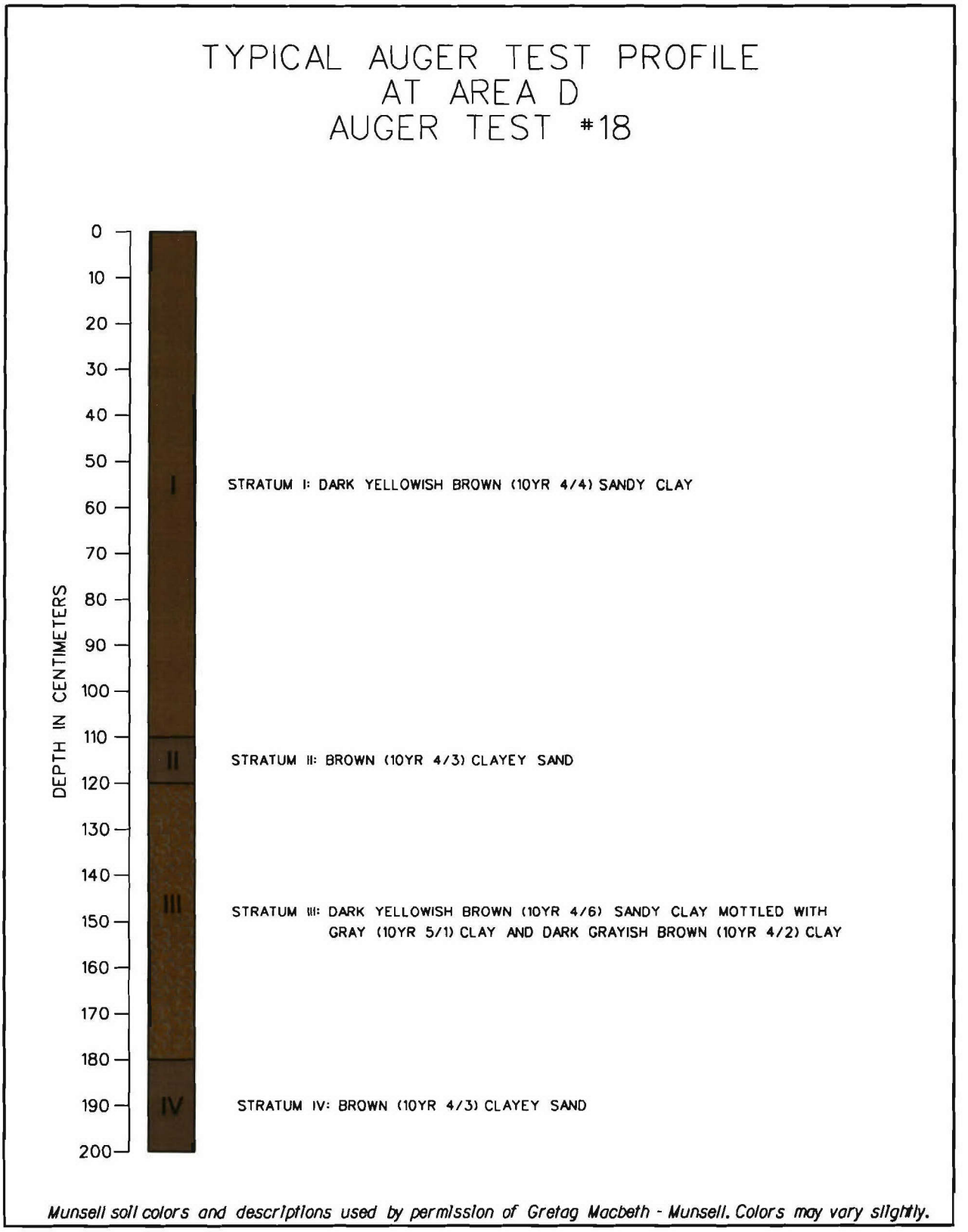


Figure 243. Profile Auger Test 18 from Transect 2 within Area D.

and it extended from 110 to 120 cmbs (43.3 to 47.24 inbs). This was underlain by Stratum III, a deposit of dark yellowish brown (10YR 4/6) sandy clay mottled with gray (10YR 5/1) clay and dark grayish brown (10YR 4/2) clay; it reached in depth from 120 to 180 cmbs (47.24 to 70.86 inbs). Finally, Stratum IV was characterized as a layer of brown (10YR 4/3) sandy clay that continued from the base of Stratum III to a maximum depth of 200 cmbs (70.86 to 78.74 inbs). No artifacts were recovered from Transect 2/Auger Test 18.

Pedestrian survey of the bankline resulted in the recovery of a single hard-mud brick fragment and a piece of a concrete block. In addition, brick fragments, broken cement slabs, portions of brick piers, glass shards, and modern trash and debris were noted on the surface but not collected. While archival research indicates that portions of Area D were inhabited by the "batture dwellers" until the mid twentieth century, these materials do not represent artifacts originating from an intact archeological deposit.

Summary of Area D

Within the Bisso Marine Inc., property (Area D), large pieces of stored equipment, dense trees, piles of debris, and a former building foundation precluded the excavation of backhoe trenches; therefore, the Phase I cultural resources survey and archeological inventory of Area D was restricted to pedestrian survey and the excavation of a series of auger tests throughout the project area. Pedestrian survey in Area D produced artifacts of dubious origin. While dwellings once existed on the property, the material collected from the ground surface cannot be associated with those buildings due to the large amount of debris and fill brought into the area to stabilize the batture. Furthermore, no structural remains from the dwellings were documented within the Area of Potential Effect.

Auger test excavations in Area D suggested that the current ground surface consisted of artificial fill deposits. For example, on the upper bankline auger tests often were impeded by the presence of impenetrable fill deposits; however, the exposed sediments were mottled greatly, an indication of the disturbed and/or redeposited nature of the soils. Along the shoreline, auger testing revealed river-deposited sediments (e.g., clays and sandy clays) to a depth of approximately 200 cmbs (78.7 inbs) that also were heavily mottled, and no intact cultural deposits were encountered. Therefore, auger testing documented approximately 5.4 m (17.7 ft) of fill within Area D. Based on the results of this Phase I cultural resources survey of Area D, no intact cultural or stratigraphic deposits were encountered.

Other Items of Historical Interest

During the course of this Phase I cultural resources survey and archeological inventory, the survey crew also was instructed to identity and record all standing structures older than 50 years in age located within the study area. While the reconnaissance-level architectural survey failed to identify any buildings of a historic nature, this survey did identify several items of historic interest that were positioned outside of the Area of Potential Effect, and they are discussed below.

A 70 m (229.7 ft) long segment of the defunct Bisso Railroad Spur was noted within the vicinity of Area B. This spur led from the Public Belt Railroad to the New Orleans Coal Company, which was established in 1908. The coal firm was merged with Bisso Towboat Company in 1922. A train engine owned and operated by Bisso Towboat Company still is present on the railroad track segment; this engine was built in 1907 (Figure 244). In addition, this railroad spur abuts the remains of a coal chute that was used to store coal prior to or after the transportation of coal from the coal ships to the train (Figure 245). The remains of a cinder block structure that house the bottom portion of a metal coal storage bin characterize the facility. The remaining railroad segment, train, and coal chute are situated beyond the limits of the Area of Potential Effect. In addition, a number of temporally diagnostic artifacts were gathered from the surface of the surrounding area. This material included a single machine made brick (ca. 1927), 14 MasterLock keys and ring (post 1924), 1 unspecified key, 1 Barq's Root Beer bottle (post 1934), 1 Wright Root Beer bottle (1934-1963), 3 clear bottle shards (post 1903), 1 bottle with an applied label (post 1934), and 1 cobalt blue jar (post 1916) (Table 19).



Figure 244. **Train engine and segment of the Bisso Railroad Spur located outside the Area of Potential Effect associated with Area B, facing east.**



Figure 245. **Cement block supporting structure for the coal chute located outside the Area of Potential Effect associated with Area B, facing east.**

Finally, within the vicinity of Area D, two objects relating to the ferry and salvage operations of Bisso Marine, Inc. were noted. The first is the remains of a screw drive and propeller salvaged from a Civil War era shipwreck in the Mississippi River near St. Rose, Louisiana (William A. Bisso, III, personal communication: August 22, 2003) (Figure 246). The second object of historical interest is the remains of the pulley system, which was used to pull the cypress, hand-rowed ferries in and out of the river. These ferries were associated with the Walnut Street Ferry, which operated around the turn of the twentieth century (Figure 247). The screw drive and pulley mechanism are important in contributing to the overall history of the project vicinity. However, neither object is *in situ,* and they are located well outside the limits of the proposed Area of Potential Effect. Discussions with personnel from the Louisiana Department of Culture, Recreation and Tourism, Office of Cul-tural Development, Division of Archaeology agreed that these extraneous items should not be assessed because they are outside of the Area of Potential Effect and do not contribute to the site area.

Site 16OR181 and Artifact Discussion

The entire terrestrial portion of the Area of Potential Effect associated with the Carrollton Revetment project has been identified as an historic artifact scatter, and it has been recorded with the State of Louisiana as Site 16OR181 (Figure 2). The site measures approximately 23 m (75 ft) east/west by 770 m (2,526 ft) north/south and it is located in the S 1/2 of Irregular Section 14 of Township 13S, Range 10E. The site area is composed of fill material that was deposited to raise the surface above flood levels before it was utilized for urban uses. The site is situated on a level bankline on the batture side of the levee, and it descends to exposed shoreline; there is an elevational difference of 1.8 m [6 ft]).

Site 16OR181 consists of fill deposits that have been modified in the past as well as present day. The site area was confined strictly to a narrow area that incorporated the 5 to 10 m (16 to 33 ft) of bankline width before plunging over the bank to the lower exposed shoreline. Background research indicated that the extreme southern portion of the site area consisted of the city dump from 1931 to the 1970s, and local informants have related numerous incidences of dumping of fill to stabilize the bankline from the encroaching river. In addition, an examination of the topography of the project area indicates that large quantities of fill were used to level the batture with the crown of the levee, which originally was a maximum of 2.4 m (8 ft) above ground surface. Excavations have confirmed the lack of intact stratigraphy and the inclusion of massive pieces of concrete, wood, and metal to build up the height of the ground. Also, the northern portion of the site often floods; hence, much of the material here may have been brought in and deposited by the river.

The artifacts recovered from Site 16OR181 date from the mid nineteenth to late twentieth centuries. Although most of the artifacts recovered are historic (i.e., at least 50 years old), a small portion of the artifact assemblage appears to date from the decades after 1953. The majority of the artifacts can be placed into three functional categories: architectural, domestic, and indeterminate. Unmarked clear container glass and unidentified metal fragments are examples of artifacts that would fall into this latter category. The artifacts are briefly discussed below.

Architectural artifacts are structural in nature, such as bricks, tile, and window glass, but also include hardware such as nails and screws. Nails are an important and often overlooked category of artifact as they can provide fairly consistent and reliable date ranges. The two nails recovered from Area D of the Carrollton Bend survey were clearly wire nails, which replaced the square cut nails by the 1890s (Nelson 1968). Wire nails could be present for many reasons, including use by the batture dwellers or by the current owners of the property, since wire nails are the primary nail type used today. It is interesting to note that in 1892, the U.S. Army Corps of Engineers specifically ordered the use of wire nails for the willow mattress revetment work just north of the current project area (United States Army Corps of Engineers 1893: 3822).

The second category, domestic artifacts, includes personal artifacts; ceramic artifacts such as plates, cups, and bowls (Figure 248); glass bottles and stoppers (Figure 249); household tools such as clothing irons (Figure 250);



Figure 246. **Section of a screw drive salvaged from a Civil War era shipwreck in the Mississippi River near St. Rose, Louisiana, and currently located outside the Area of Potential Effect associated with Area D.**



Figure 247. **Section of the pulley system used from moving ferries; it is currently located outside the Area of Potential Effect associated with Area D.**

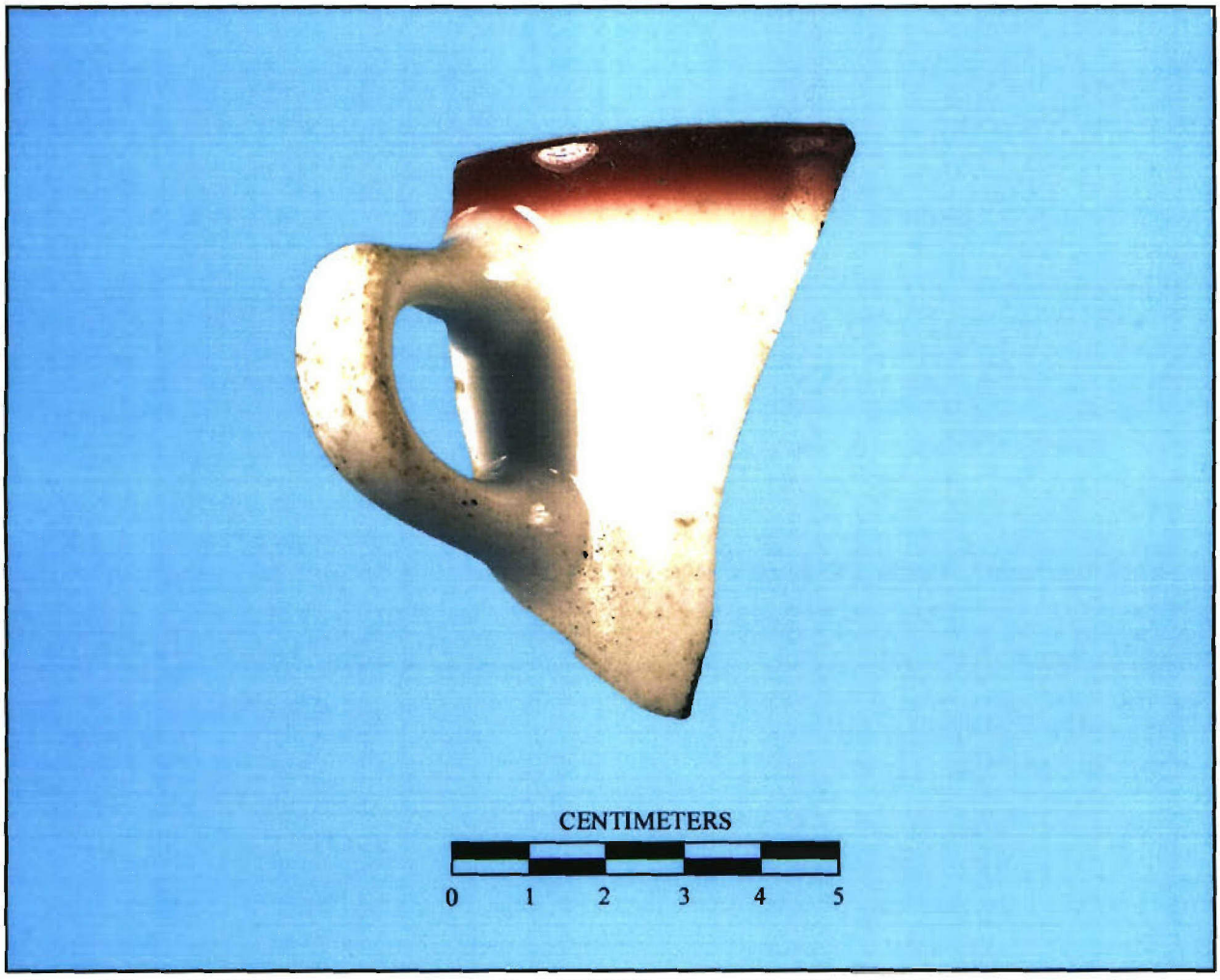


Figure 248. **Partial ironstone edge decorated cup (FS# 18) recovered from Trench 1 during excavation of Area B at Carrollton Bend.**

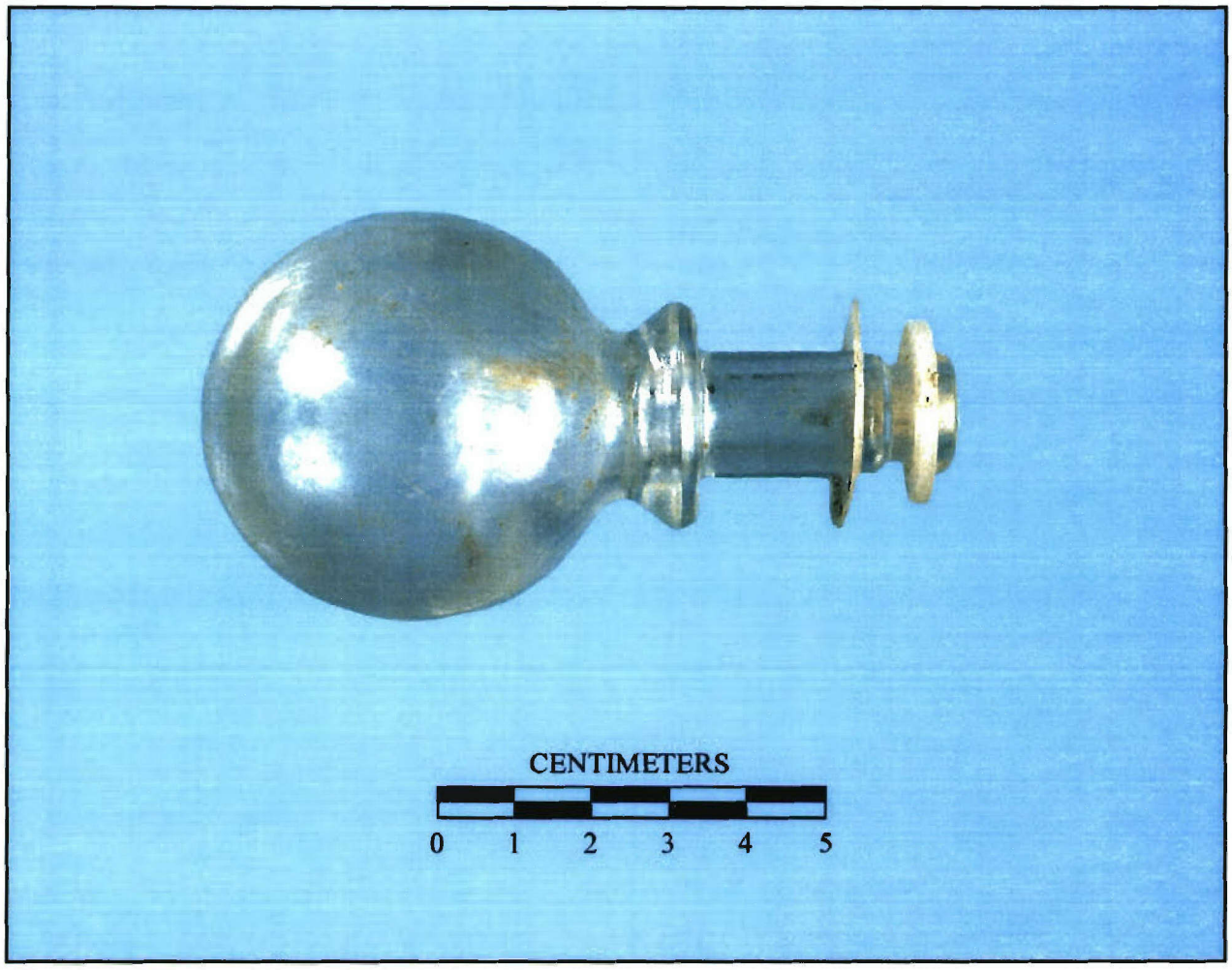


Figure 249. **Large, glass container closure/stopper (FS# 41) recovered from Trench 3 during excavation of Area A at Carrollton Bend.**

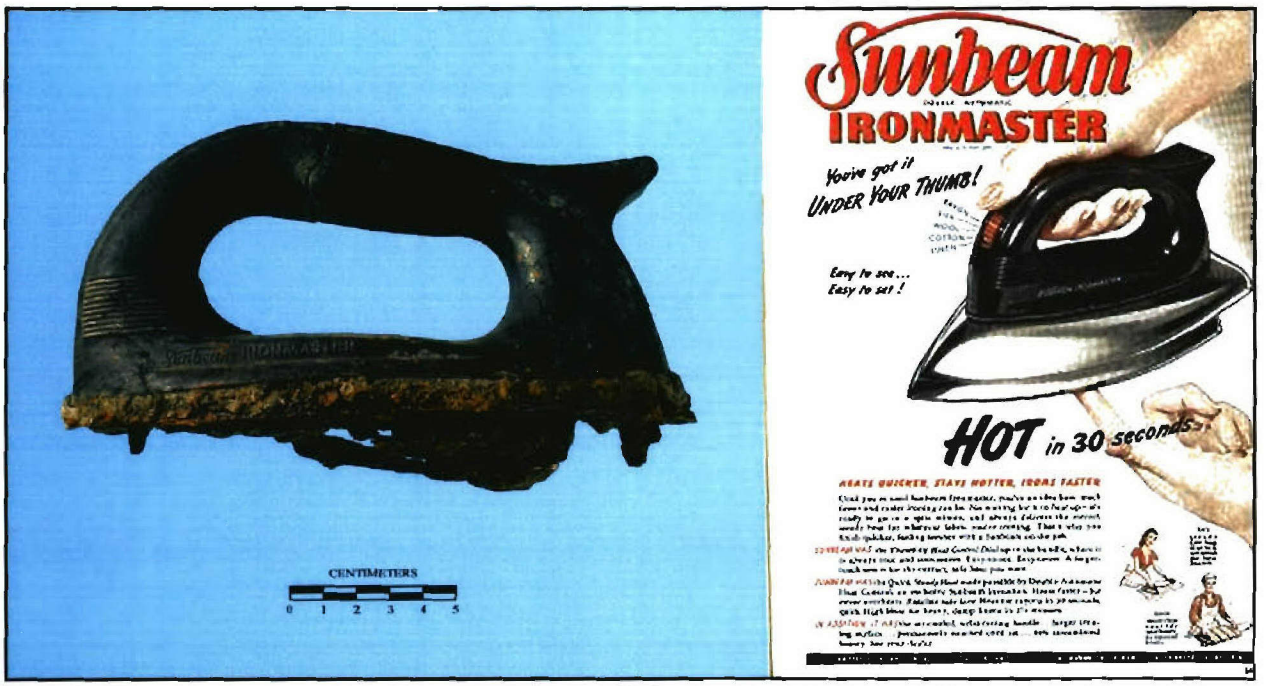


Figure 250. **Sunbeam ad: Bakelite clothing iron (FS# 03) embossed with "Sunbeam Ironmaster" recovered from during surface collection of Area D at Carrollton Bend, with copy of advertisement from 1949 for the Sunbeam Ironmaster.**

and other items relating to food consumption such as a plastic Popsicle stick (Figure 251), tin cans, and can pull tabs (Figure 252). Personal artifacts such as a shell button and a portion of a metal watchband were recovered from Areas B and D, respectively. Also collected from Area B was a mottled orange, white, and clear glass marble from a child's play-set and a set of MasterLock keys; however, the keys are work related. These keys are made of a copper-alloy and exhibit an interesting design (Figure 253). The full body of a lion is embossed on one side with the Master lock logo in a vintage-style script impressed on the opposite side. The Master lock brand first was produced in 1924 (Master Lock 2003). In all, they present a stylistically Deco to Art Nouveau focus, and as such probably also date to the mid-twentieth century.

Ceramics and glass make up the vast majority of the artifact assemblage recovered from the project area. The greater part of the ceramic subassemblage falls into the food consumption/storage category. Ceramic artifacts recovered during this project consisted of whiteware and ironstone, while a few sherds of yellowware, porcelain, and stoneware also were present. Although datable by their initial manufacture date, i.e., whiteware began production by 1820, while ironstone production began in 1845, some of these ceramic types were produced throughout the nineteenth and twentieth centuries (South 1977). For more precise dating, one must rely on maker's marks and decorative and stylistic techniques present on the ceramic sherd. The exception to this would be stoneware, which is more characteristically a nineteenth to very early twentieth century ceramic, and will be discussed further below.

Most characteristic of the nineteenth century artifacts is a whiteware rim sherd decorated in a blue shell edge technique from Area D (Figure 254). This decorative technique can be divided into temporally distinct varieties. The shell edged whiteware rim sherd recovered from the study area falls within the "bud" pattern, dating, popularity-wise, from 1820 to 1850; the "bud" pattern is a series of impressed, curved lines occasionally interrupted by an abstract bud design (South 1977). Blue is the most common color found on these wares.

Fragments of hand-painted floral polychrome whiteware also were recovered from Area D (Figure 254). Black stemmed floral polychrome techniques are typically recognized as early-mid nineteenth century wares, typically dating from 1830 to 1870 (Mansberger 1986). Nineteenth century hand-painted floral decoration typically possessed distinct brush lines and abstract patterning. Furthermore, although black stems are common, petals and other elements are rarely outlined. However, this yellow and black design is not stylistically typical of nineteenth century pieces, but is more likely to represent a mid-twentieth century item.

A second typical nineteenth century artifact recovered from Area B is a yellowware lid with a "Rockingham" design (Figure 255). Yellowware, particularly Rockingham decorated, most often is dated from 1830 to 1900 (Ramsay 1947).

The single recognizable maker's mark within the ceramic subassemblage is present on an ironstone saucer recovered from Area D (Figure 256). The mark exhibits a partial view of an American Indian decorating a pot. The Shenango Pottery Company first used this mark in 1901, and it is still in use today (Lehner 1988). Shenango Pottery Co. makes a wide variety of ceramic ware, but plain ironstone is noted particularly as "hotel ware." In fact, undecorated, thick white ironstone china is typical of that found within hotels and other commercial eateries today.

Other ceramic types recovered from the project area included a few transfer-printed pieces, including one partial porcelain teacup from Area A (Figure 257). Transfer-printing is a decorative technique was used widely by the 1790s; it is recognized by a complex design placed underneath a clear glaze (Mansberger 1986). Blue, red, or green transfer-printed wares are very common on both nineteenth and early twentieth century sites, but still are produced today.

Stoneware is a hard and dense utilitarian ceramic most often used for food storage items such as jugs and crocks, but it also can be found on decorative items such as figurines. A single stoneware jug recovered from Area B is decorated with a simple, chocolate brown Albany

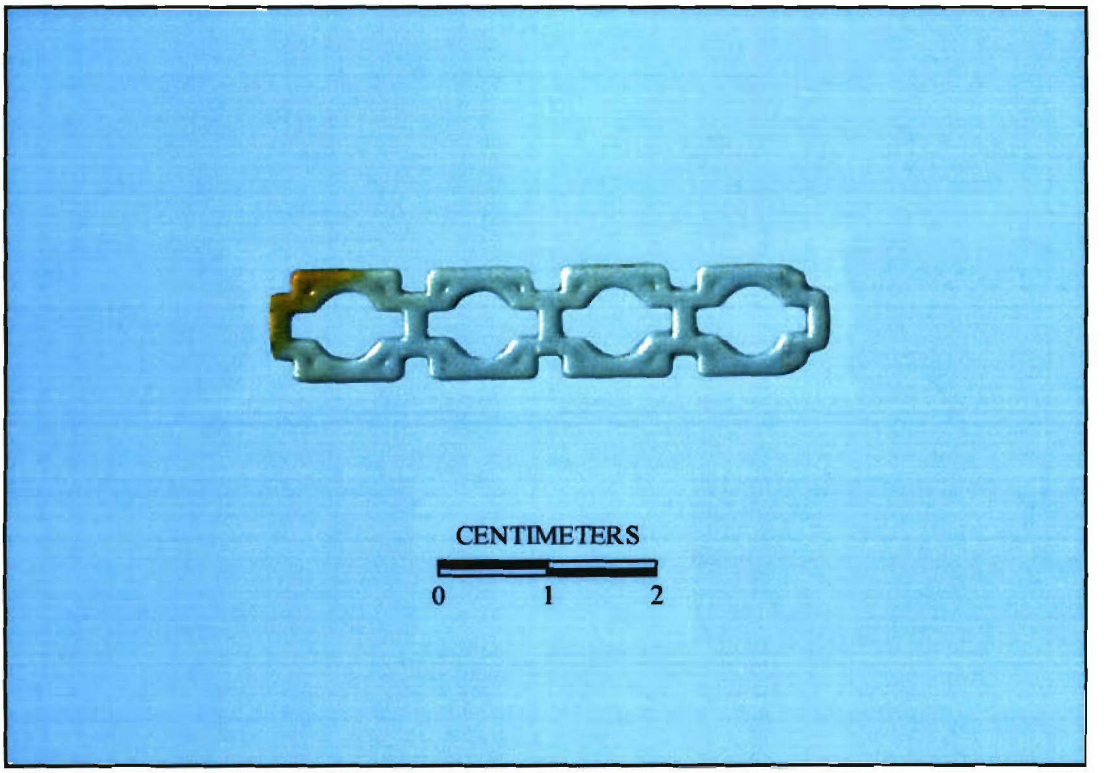


Figure 251. **Partial plastic Popsicle stick (FS# 42) recovered from Trench 3 during excavation of Area A at Carrollton Bend.**



Figure 252. **Selected pull-tabs from aluminum beverage containers (FS# 27) recovered from Trench 6 during excavation of Area B at Carrollton Bend.**

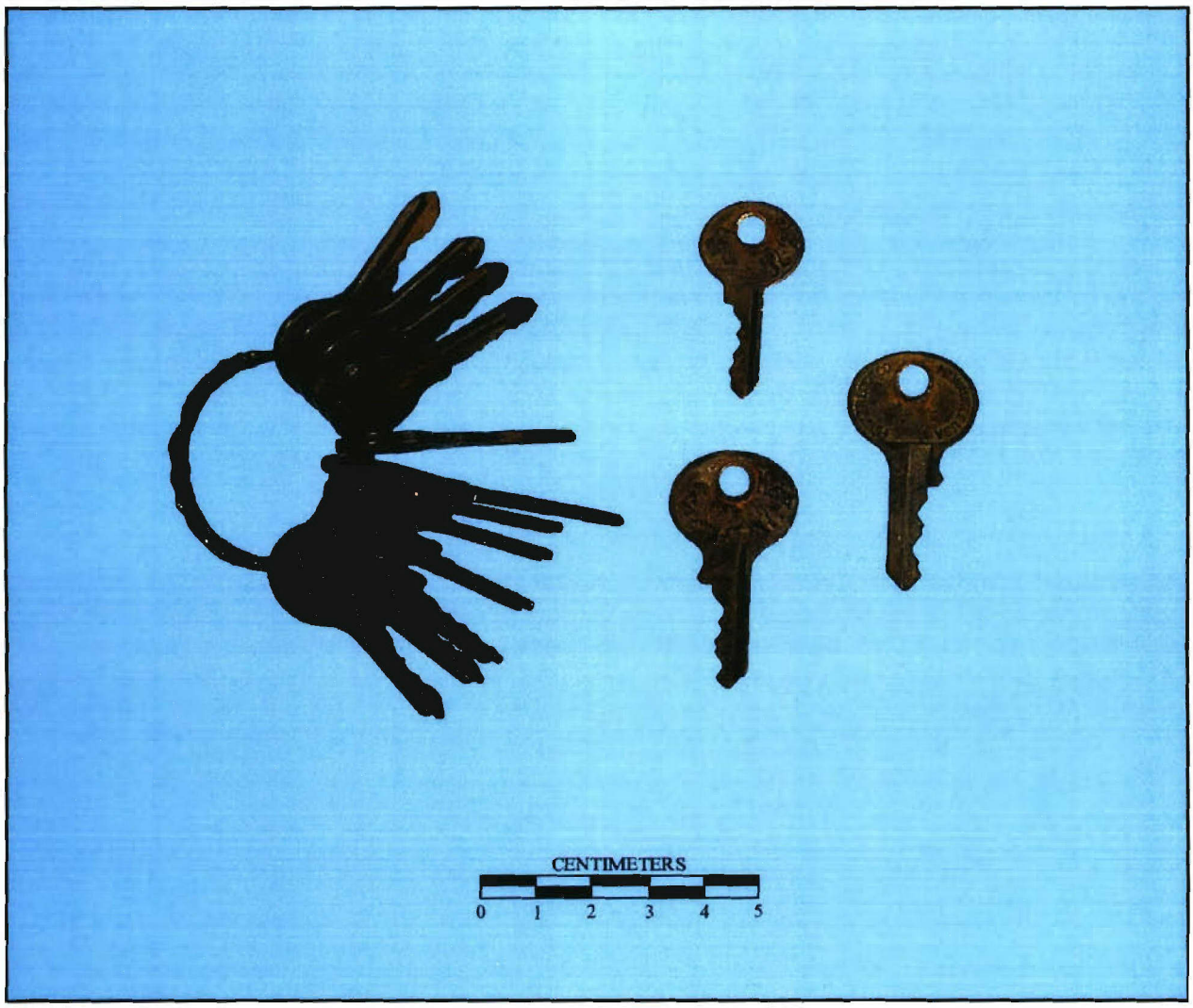


Figure 253. **Set of Master Lock keys (FS# 12) recovered during surface collection of Area B at Carrollton Bend.**

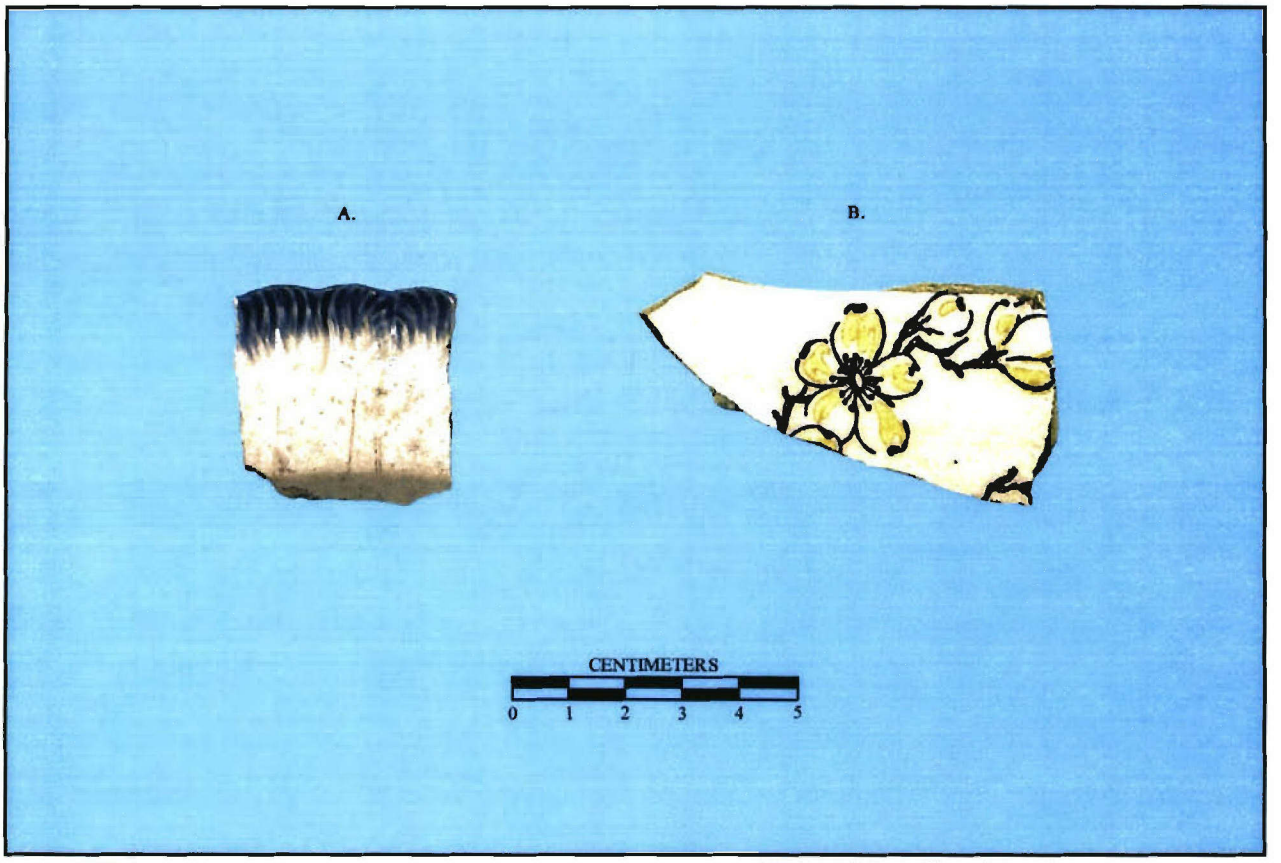


Figure 254. **Selected whiteware sherds recovered during surface collection of Area D at Carrollton Bend: a) shell-edge decorated whiteware rim sherd (FS# 04); and b) hand-painted whiteware base sherd (FS# 03).**

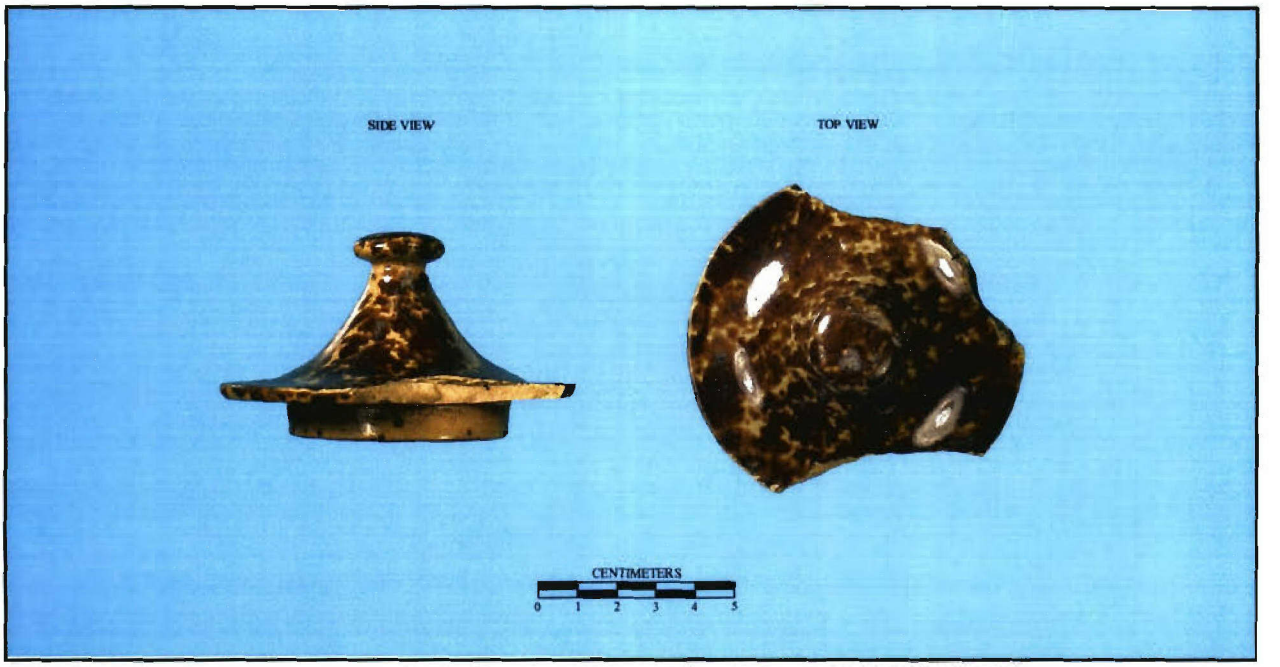


Figure 255. **Side and top view of a Rockingham decorated yellow-ware sherd (FS# 14) recovered during surface collection of Area B.**

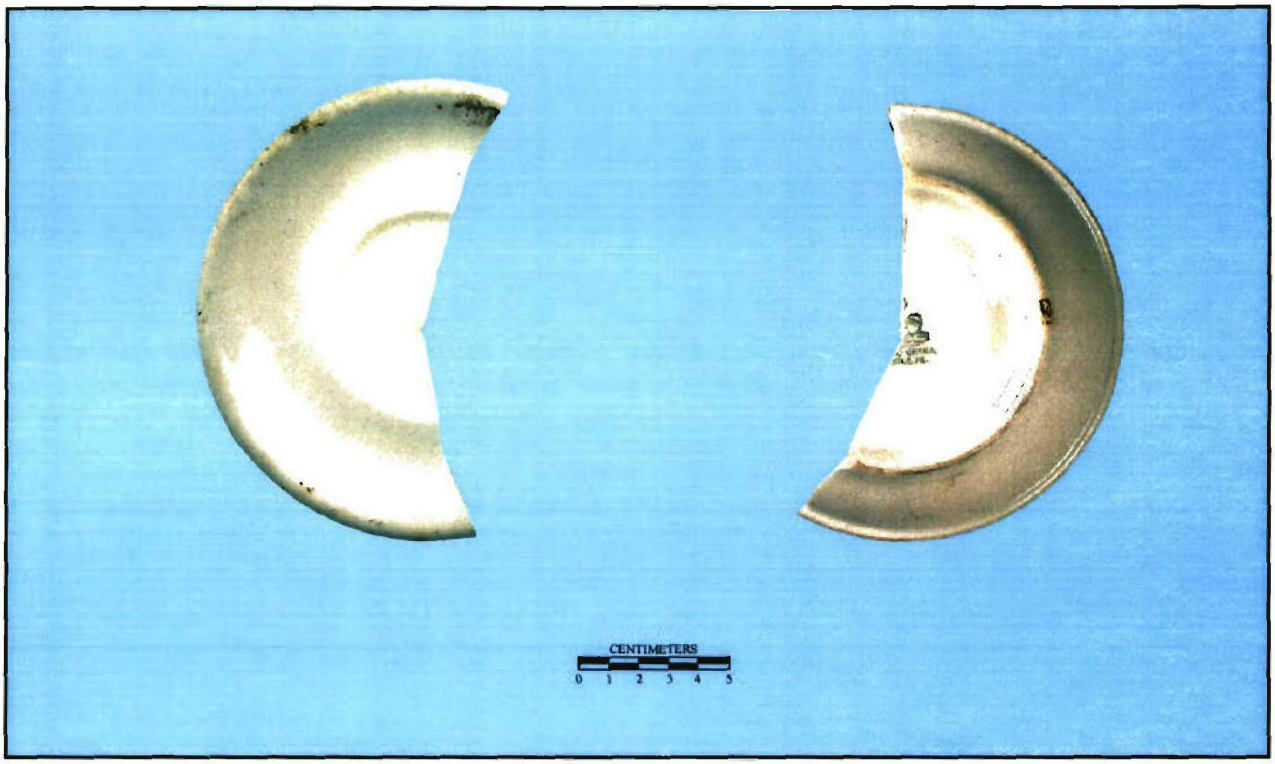


Figure 256. **Top and base view of an ironstone saucer with the maker's mark for Shenango Pottery Company (FS# 04) recovered during surface collection of Area D at Carrollton Bend.**

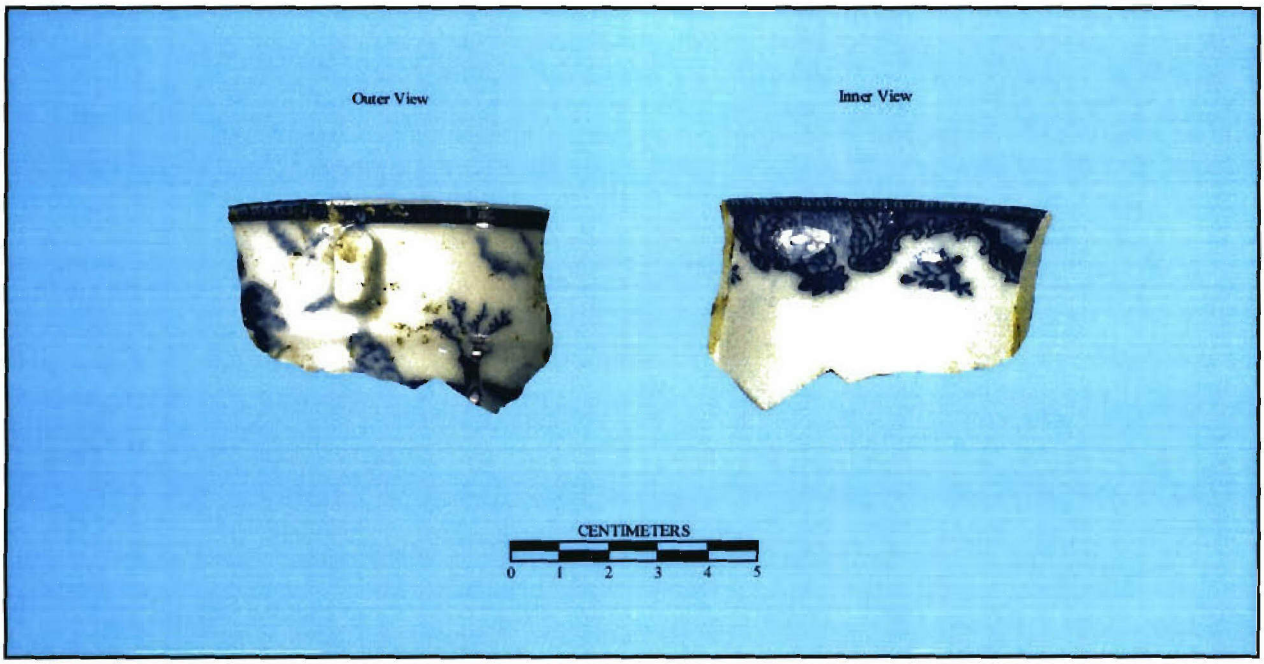


Figure 257. **Side view of a partial transfer printed porcelain teacup (FS# 38) recovered from Trench 3 during excavation of Area A at Carrollton Bend.**

slip most commonly was used before 1900 (Figure 258), while the other two shards have a white Bristol slip with blue decoration that was popular after 1890 (Webster 1971).

Glass, in the form of bottle or container bases and finishes, also can be very diagnostic artifacts. The automatic machine-made bottle is a typical twentieth century development, having been invented in 1903 by Michael Owens (Munsey 1970). Techniques of manufacture, therefore, along with maker's marks on the bottle base, can provide distinct dates. Machine-made glass bottles first were manufactured by a suction technique that pulled a glass 'gather' into the mold, but left a round "Owens suction scar" on the base (Munsey 1970). This technique was in use until 1969 and provides a *terminus post quem* date. Many of the bottle bases recovered at Carrollton Bend exhibit the Owens suction scar. Another common mark found on the bottle bases is the maker's identification for the Owens-Illinois Glass Company (Figure 259). This mark, consisting of an 'I' within a circle or diamond, is temporally diagnostic. The circled "I" dates from 1954 to present day, while the diamond and "I" date from 1929 to 1954 (Toulouse 1971). Both forms of Owens-Illinois maker's marks are represented within the artifact assemblage. The Owens-Illinois Glass Company also produced many of the more common glass brands manufactured during the twentieth century, such as "Duraglass" jars (Figure 259). The mark of another common twentieth century manufacturer, Hazel-Atlas (ca. 1920 to 1964), also was recovered from Area B (Toulouse 1971).

The final objective of artifact analysis, however, is not simple chronological seriation, but the interpretation of the artifacts and what they reveal about past lifeways. Typed artifacts can provide valuable insight into daily activities of the historic inhabitants of the project area. One artifact recovered from Area B, a small cobalt blue glass jar embossed "BROM.../EM...," refers to a type of headache medicine, Bromo-Seltzer, and it was manufactured in threaded glass containers by Captain Isaac Emerson of the Emerson Drug Company from 1928 to 1986 (Fike 1987). Captain Emerson of Baltimore, Maryland, and architect Joseph Evans Sperry, are also known as the builders of the landmark Emerson Bromo-Seltzer Tower, now on the National Register of Historic Places as the tallest building in the City of Baltimore.

Many of the artifacts recovered from the project area have origins that can be traced to New Orleans. For example 4 bottles and 1 can of root beer soda were recovered from the Areas of Potential Effect. A total of 2 Wright brand and 2 Barq's brand root beer are present in this collection. All exhibit an applied color label; this technique dates from 1934 to present day. One such label proclaims that consumers should "Drink the Wright Root Beer;" and was bottled by "Washington Ice-Royal Products" in New Orleans, Louisiana (Figure 260). The Royal Products Division of Washington Ice-Royal Products of New Orleans lasted from 1943 to 1963, when it was purchased by new owners from Baton Rouge and renamed the Wright Root Beer Company of New Orleans, Inc. (Louisiana Secretary of State 2003). This company also bottled the almond-flavored "Dr. Nut" brand soft drink, which was made famous by the Pulitzer Prize winning novel, *A Confederacy of Dunces*, written by New Orleans native John Kennedy Toole (1937-1969); however, no examples of the "Dr. Nut" brand were recovered during this investigation.

Only one of the two recovered Barq's Root Beer soda bottles was manufactured by the Cascade Bottle Works of New Orleans, Louisiana (Figure 261). The technique of an applied color label, along with an Owens-Illinois maker's mark, dated this bottle from 1934 to 1954 (Toulouse 1971). Finally, a single root beer soda can that was recovered from Area B identifies the original product as "Rex Draft Root Beer" that was "Canned by LA Coca-Cola Bottling Co." The Louisiana Coca-Cola Bottling Company was incorporated in 1937 (Louisiana Secretary of State 2003). There is little other information about this brand, except personal notes stating that Rex was the local variant of Fanta (Walker 2003). In addition, the Internet radio show "New Orleans Nostalgia" references radio advertisements for Rex Root Beer in the 1960s (New Orleans Radio 2003).

In addition to the soda bottles mentioned above, several glass shards recovered from Areas A, B, and D were identified as containers for Sure-Klean bleach, which was bottled by F. Uddo and Sons (Figure 262). The New Orleans Public Library's building plans database located

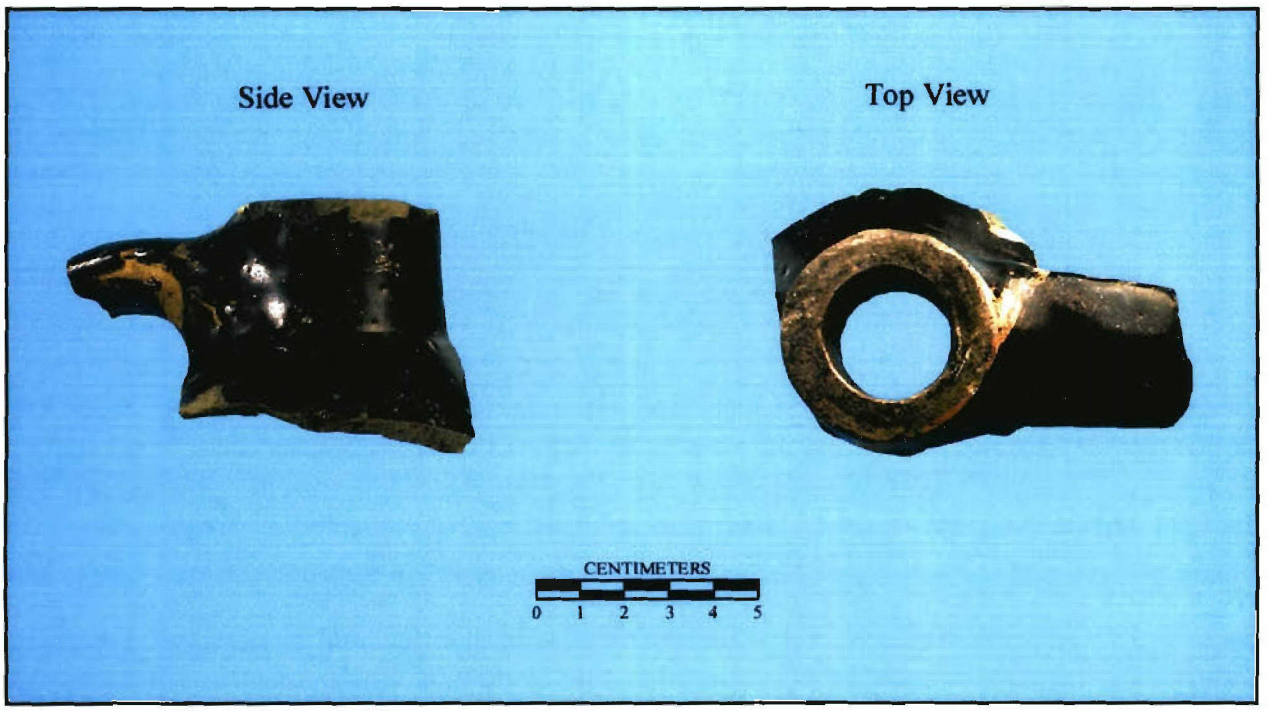


Figure 258. **Side and top view of an Albany slip decorated stoneware jug finish (FS# 17) recovered during surface collection of Area B.**

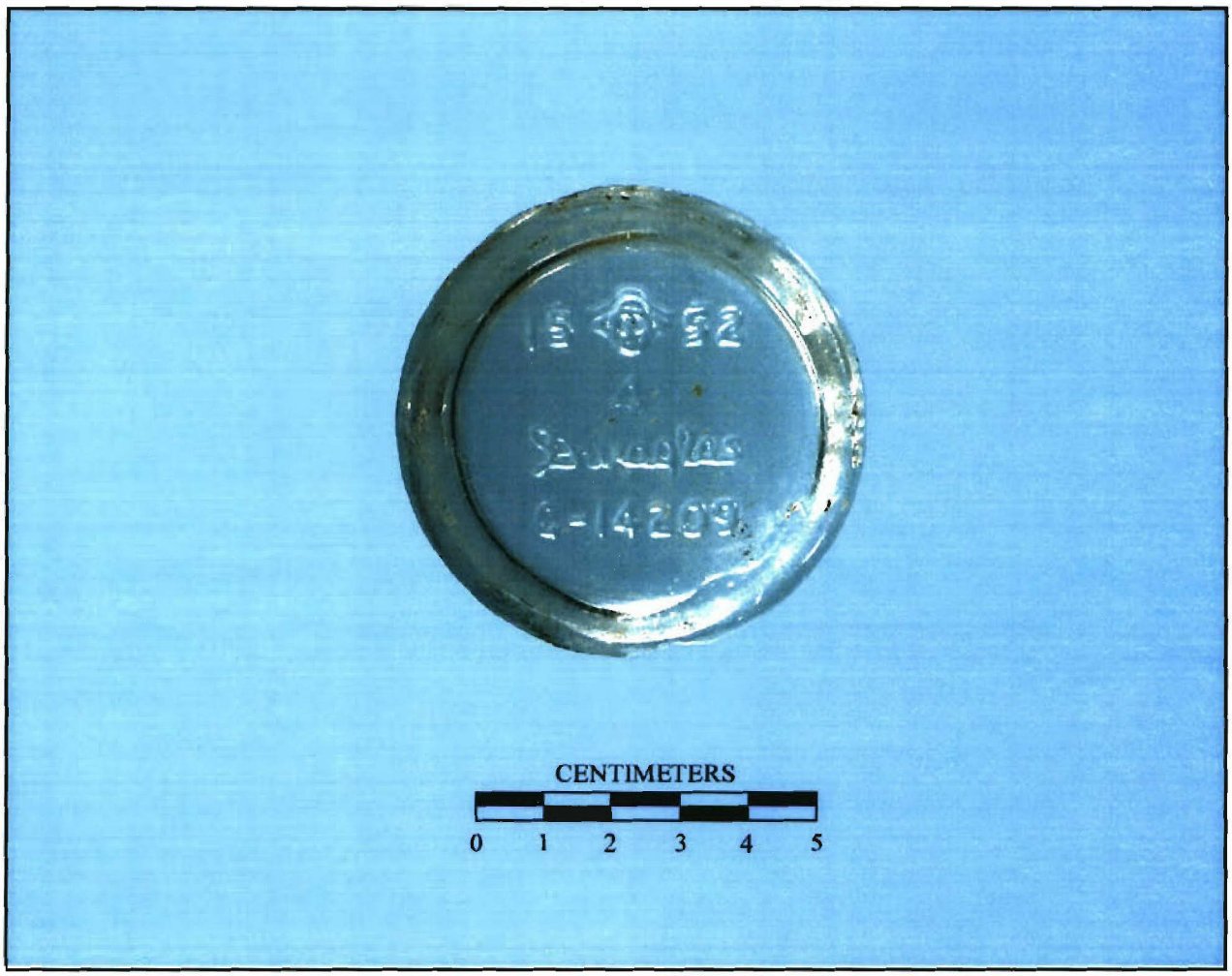


Figure 259. **Bottle base embossed with 'Duraglass' in script, and maker's mark for Owens-Illinois Glass Co. (FS# 15) recovered during surface collection of Area B.**



Figure 260. **Front and back views of Wright Root Beer bottle manufactured in New Orleans (FS# 07) recovered during surface collection of Area B.**

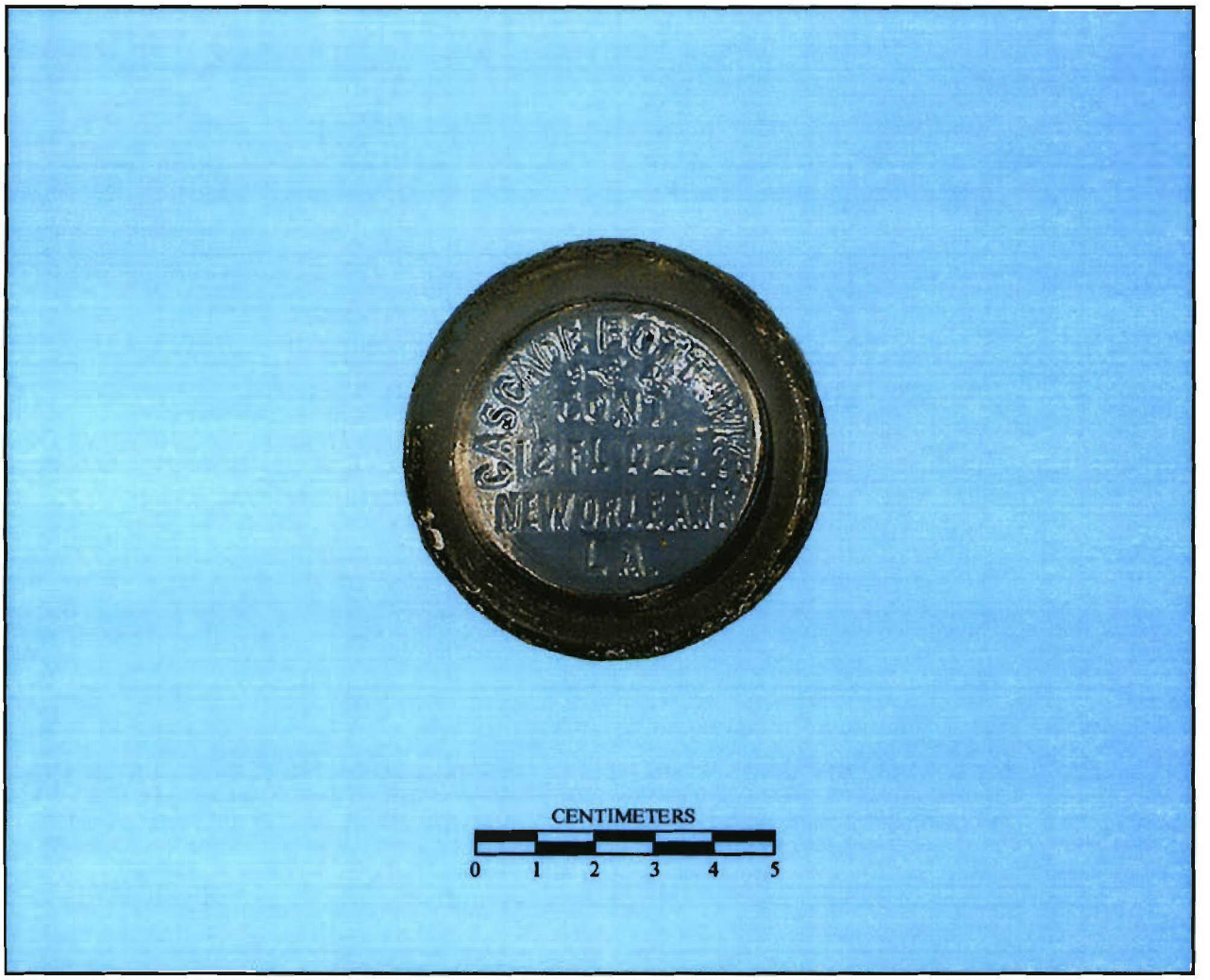


Figure 261. **Barq's Root Beer bottle base manufactured in New Orleans (FS# 11) recovered during surface collection of Area B.**

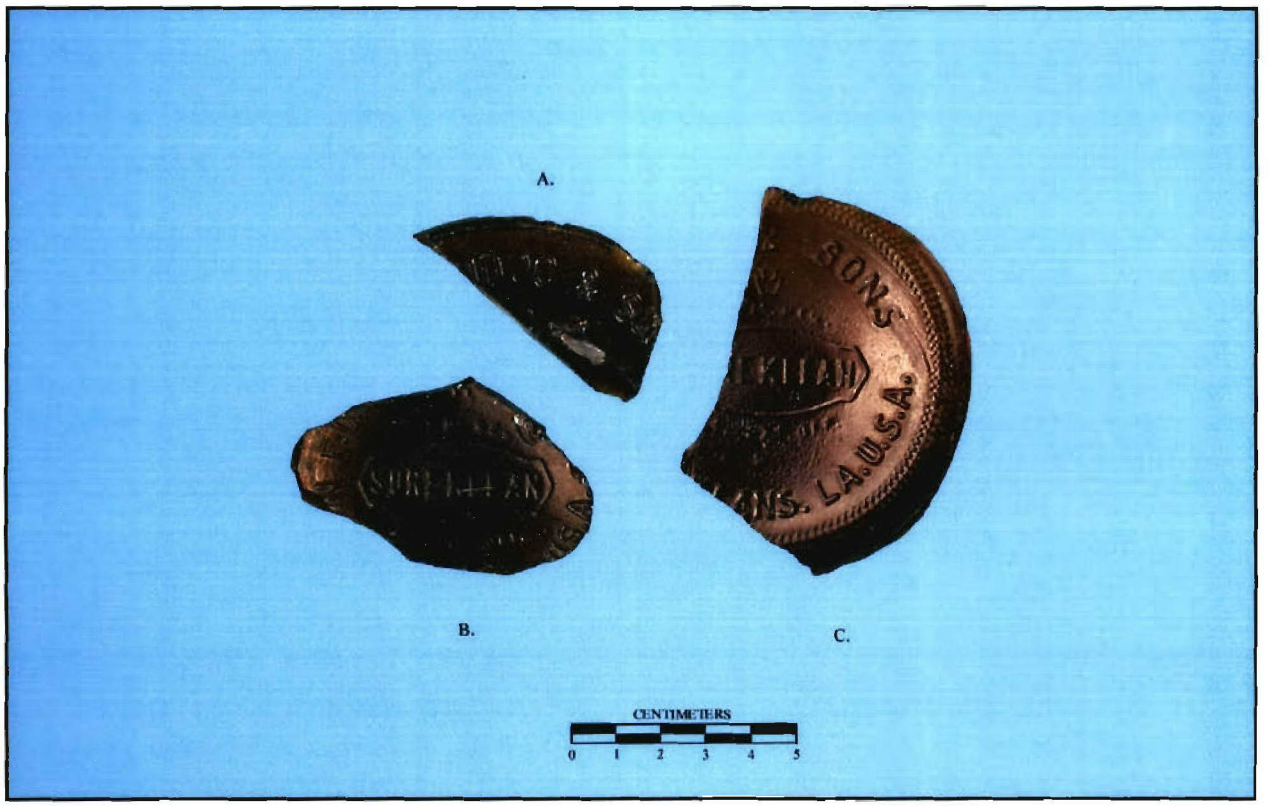


Figure 262. **SureKlean Bleach bottle bases manufactured by F. Uddo and Sons of New Orleans recovered during surface collection of Areas D and B: a) FS# 15, embossed "...UDDO & SO..."; b) FS# 15, embossed "F. UD.../ SUREKLEAN/ U.S.A.; and c) FS# 03, embossed "& SONS/ ...REKLEAN/ ...LEANS, LA. U.S.A.".**

the Uddo and Sons Chemical Plant at 200 Bienville Street, New Orleans, on March 9, 1946 (New Orleans Public Library 2003). Although no record for F. Uddo and Sons is present in the Louisiana Secretary of State business and corporations database, Sure-Klean bleach probably was manufactured at this location.

Maker's marks also were pressed into machine-made bricks; two such bricks were recovered from Area B. The first brick belonged to the well-known St. Louis Vitrified & Fire Brick Company; the brick dates to the 1920s. The St. Louis Vitrified & Fire Brick Company is a national company based in St. Louis, Missouri. The second brick was produced by the St. Joe Brick Company of Slidell, Louisiana (Gurke 1987). Active for the last 110 years, the St. Joe Brick Company began to stamp their bricks in the early 1900s. This brick type commonly is found along the brick paths and sidewalks of the Garden District between St. Charles and Jackson Street in New Orleans that were constructed in the 1920s and 1930s.

Finally, analysis of the cultural stratigraphy across the site area indicated a lack of intact cultural deposits. That is, temporally diagnostic artifacts dating from the early nineteenth century were recovered stratigraphically nearer to the surface than those items dating from the mid to late twentieth century. For example, in Area A, a 1970-1980 plastic Popsicle stick was recovered from the same depth (1.6 to 1.7 mbs ([5.2 to 5.6 ftbs]) as a transfer printed whiteware sherd that may have been produced as early as 1830. Similarly, in Area B, 1 1962 to 1974 aluminum can pull-tab was recovered from a depth of 0.8 to 0.9 mbs (2.6 to 3 ftbs), while nineteenth century ceramics originated from higher levels (i.e., 0 to 0.7 mbs [2.3 ftbs]).

While research performed by noted archeologists such as William Rathje and Cullen Murphy (1992) have been able to provide insights into racial, gender, and age demographics from trash dumped in modern landfills, the material and depositional processes involved in the development of this area preclude such analysis. For example, the massive amounts of construction debris (i.e., concrete, pipes, and metal) present throughout the site area, in comparison with material related to food consumption and storage, negate the possibility of defining demographic trends within the deposits. In addition, the absence of stratigraphy depicting fill layers spatially does not allow for a study of depositional activities and material through time. Therefore, the lack of intact cultural deposits indicates that Site 16OR181 retains little, if any, research potential. It does not possess the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional work is recommended for this site.

CHAPTER IX

SUMMARY AND RECOMMENDATIONS

This report has reviewed the results of cultural resources survey of the Carrollton Revetment Project Area in Orleans Parish, Louisiana. This effort has comprised review of the geomorphic and natural settings of the project area, preparation of detailed prehistoric and historic contexts, and terrestrial archeological survey and testing, incorporating both deep auger testing and systematic and purposive mechanical excavations. In addition, a separate and thorough review of the history of river transport, commerce, and of the types of watercraft that historically plied the waters of this stretch of the Mississippi River also was conducted. That research effort incorporated oral historical interviews, examination of historic maps, illustrations, and air photos, as well as review of the particularly relevant private archives of the Bisso family, which has operated a variety of maritime industries in much of the project area for the last century. Remote sensing study of the underwater portion of the project area was undertaken in order to permit characterization of the nature and range of submerged shipwrecks present, as well as to permit identification of a number of those vessels.

Historical and archeological study of the terrestrial portions of this project area revealed a unique history of demolition, land filling, levee setbacks, and of public and private uses. However, that history largely precludes the survival until today of any *in situ* archeological sites and deposits. Rather, the artifacts and depositional milieux encountered in the project area almost uniformly were redeposited, especially during the use of this area as a public landfill, and due to river action along the batture. Both the archeological and historical data corroborate the mechanical leveling and further disturbance of these landfill deposits. As a result, historic archeological deposits in the terrestrial portion of the project area illustrate (at least) tertiary contexts, and therefore lack both integrity and substantive research potential. While a single archeological site, Site 16OR181, was identified and recorded, the recordation of this site in effect simply memorializes both the site formation and destructive processes that have contributed to an archeological setting devoid of intact stratigraphy, either horizontal or vertical, and of substantive research potential. Similarly, the land use history of the project area, which incorporates episodes of levee setbacks, filling, and the intentional demolition of virtually an entire neighborhood, has removed any potentially historic standing structures from the area. As a result, the terrestrial portion of the project area does not contain any cultural resources that possess the qualities of significance as defined by the National Register criteria (36 CFR 60.4 [a-d]). On the batture, levee, and terre firme within the project area, at least, this proposed undertaking would not affect any historic properties.

The underwater portion of the project area is much more complicated, both substantively and methodologically. The project area is located at the Greenville Bend, a virtual catchment for submerged watercraft lost at or in transit to our nation's busiest port, on America's premier commercial waterway. This situation is compounded by the historic presence of an active ferry landing and of a sequence of commercial and industrial shipyards and staging areas precisely within the Area of Potential Effect for this project. The latter businesses especially reflect the enterprising efforts of the Bisso family, who

understood the strategic commercial importance of this venue, and who were able to adapt their businesses to changing economic conditions and needs over many decades of river-based activities. Due to a variety of circumstances, including at least one notorious collision on the river, the loss of vessels from the various Bisso fleets contributed to the creation of a virtual shipwreck graveyard at this location.

Discrimination of the individual vessels that comprise the nineteen submerged watercraft in the project area is made exceedingly difficult by the same setting that contributed to their sinking. The river is swift, turbid, and deep, and at several locales within the project area, sunken watercraft are stacked like random cordwood on the river bottom, sometimes four to six vessels deep, where they are admixed with debris and mechanical equipment lost during accidents and hurricanes. Because these conditions make archeological diver investigation prohibitively dangerous, inventory of the vessels that comprise this archeological palimpsest had to rely on remote sensing data, underwater imaging techniques, and on the direct historical approach. Fortunately, the records of the various Bisso family operations, ship enrollment records, the records of the U.S. Army Corps of Engineers, eyewitness accounts, oral historical interviews, and interpretation of aerial photographs together have augmented the remote sensing data. As a result, this effort has been successful in delineating the nature and range of variability of the vessels sunk within the project area. It also has been possible to identify a number of those vessels probatively, and to correlate those identifications with recorded information on the individual histories of those vessels.

Not surprisingly, the shipwreck inventory of the project area reflects the types or classes of vessels most frequently found on the river in this area. Barges, including specialty barges like tank barges and coaling barges, are most common, followed closely by other work boats such as tug boats and push boats. In general, these vessels represent examples of classes of vessels that survive today in active use, that are well known or that have been recorded thoroughly elsewhere, or that lack either distinction or direct associations with important personages, events, or patterns of history. Furthermore, many, if not most of these vessels have been shown to lack integrity, primarily due to their documented histories of refits and of the intentional removal or salvage of their key parts, such as their engines. Others were severely damaged in fires or collisions documented in the historic record. Still others have been shown with remote sensing data to have been damaged severely or destroyed, either during their sinking or due to collapse post depositionally. As a result, the vast majority of the nineteen shipwrecks inventoried in the project area do not possess the qualities of significance as defined by the National Register criteria (36 CFR 60.4 [a-d]).

However, two vessels in this inventory are noteworthy, and merit special consideration. Curiously, the first of these, essentially a railcar ferry barge named the *Gouldsboro* in its last incarnation, turns out to comprise the vestiges of the *Chickasaw,* a Milwaukee Class Civil War monitor designed by the famous marine engineer James B. Eads. The gunboat *Chickasaw* played a significant role in the Battle for Mobile Bay, under the general command of Admiral David G. Farragut, and it compelled the surrender of Admiral Franklin Buchanan and of the *C.S.S. Tennessee*. This vessel appears to be the last surviving example of the Milwaukee Class monitors. The *Chickasaw* should be considered to possess the qualities of significance as defined by the National Register criteria (36 CFR 60.4 [a-d]), under all four of the criteria, for its associations with events, with Eads, as the last example of its class, and for its research potential. However, historical research has shown that in its conversion to a railcar ferry barge, her superstructure was removed.

However, remote sensing data indicate that at least her hull, which is a character-defining feature, is relatively intact. These caveats notwithstanding, because this vessel probatively demonstrates significant associations across the spectrum of the National Register criteria, and since it is the last surviving example of its class or method of construction, it should be viewed as a significant resource, and as eligible for listing on the National Register of Historic Places.

Another vessel, the early twentieth century catamaran ferry *A.M. Halliday*, also is noteworthy. This vessel is an example of a class or type of design, *i.e.,* catamaran ferries, that appears to

be particularly well-suited both to this part of the Mississippi River, with its swift currents, and to its function (Criterion C). It also should be viewed as significant under Criterion A for its direct association with the transportation theme articulated in *Louisiana's Comprehensive Plan,* and for its role in contributing to the growth of both Carrollton and Westwego. Further study of this vessel type also may contribute to understanding of the history of construction of catamaran ferries, and of their use along the Mississippi River (Criterion D). Thus, the A.M. Halliday appears to possess the qualities of significance as defined by the National Register criteria (36 CFR 60.4 [a-d]). Its hull, a character-defining feature built to accommodate four screw propellers, appears to be at least partially intact. Given the limitations of the data that can be brought to bear at this time, its potential significance under multiple criteria argue that this vessel should be considered potentially eligible for nomination to and listing on the National Register of Historic Places.

As a result of the analyses contained in this report, it appears that two shipwrecks in the project area are significant applying the National Register criteria. Based on current project plans, it also appears that these two vessels will be affected through the emplacement of stone as a result of the planned Carrollton Revetment Project. The New Orleans District should inform the Louisiana SHPO that this planned undertaking will have an effect on historic properties, pursuant to 36 CFR 800.4(d)(2), and seek concurrence in that determination. Furthermore, the New Orleans District should consult with the Louisiana SHPO in the application of the criteria of adverse effect, pursuant to 36 CFR 800.5(a)(1). Based on current project plans, the proposed placement of stone around these two vessels actually will stabilize them in place, and reduce or eliminate the scouring that currently threatens to undermine the hulls. As a result, this project actually will have a beneficial effect on long term preservation of these two historic properties. Therefore, the two historic properties in question, the *Chickasaw* and the *A.M. Halliday*, will not be adversely effected under 36 CFR 800.5(2)(i) and (ii).

Thus, the New Orleans District should consult with the Louisiana SHPO (1) to seek concurrence in determinations of eligibility for the *A.M. Halliday* and the *Gouldsboro/Chickasaw*; (2) in the application of the criteria of effect; and (3) in the application of the criteria of adverse effect. Presuming concurrence from the Louisiana SHPO that this proposed undertaking will not have an adverse effect on historic properties (36 CFR 800..5 [5]), the New Orleans District should follow the procedure outlined for agreement with findings at 36 CFR 800.5 (c)(1). This would complete the consultation requirements promulgated pursuant to the National Historic Preservation Ace of 1966, as amended, Section 106.

As noted above, the two properties in question are significant largely because of their associations (Criteria A and B) or as representatives or examples of methods or types of construction. Although both have the potential to provide information important to understanding of history (Criterion D), the condition of the vessels largely limits such informational potential to additional archival and documentary research to create and save a permanent record of these vessels and vessel classes. In this light, and in response to the *Executive Order: Preserve America* (March 3, 2003), which articulates the policy of the Federal Government to provide leadership in preserving America's heritage, the New Orleans District should consider design and implementation of an historical outreach program that shares information on these two historic vessels with the public. This highly visible project area, within the American Heritage Rivers Corridor, has the potential to contribute to heritage tourism and community economic development IAW Section 3(a) and Section 5 of *Executive Order: Preserve America.*

Furthermore, as noted in detail above, in the section of this report describing the history of the project area, the Carrollton Revetment Project area was the home of Mahalia Jackson, the musical artist whose talent and whose commitment to the Civil Rights Movement garnered her international acclaim and renown. However, her home neighborhood has lost its integrity, having been destroyed by river encroachment, levee setback, and land filling activities. This area, therefore, cannot be considered significant due to the complete loss of its setting and integrity. There also is no surviving recognizable

place or entity that could be interpreted as a Traditional Cultural Property (TCP).

Nevertheless, and in light of the *Executive Order: Preserve America*, it might be fitting for the New Orleans District to explore the possibility either of erecting a memorial monument to Mahalia Jackson along the levee in this area, or of including her and her origins in an interpretive booklet or other public outreach media. While doing so clearly would be outside of and beyond the scope of compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, such an effort would serve to educate the public about the humble place of origin of a singer and statesperson who contributed mightily to the spiritual and political growth of our nation. The location of Mahalia Jackson's home is a little known fact today, even among residents of the area.

BIBLIOGRAPHY

Albion, Robert, William Baker, Benjamin Labaree, and Marion Brewington
1972 *New England and the Sea*. Mystic Seaport Museum, Inc., Mystic, Connecticut.

Alison, Alexander
2003 Photographic Collection. Orleans Parish Public Library, City Archives Division. New Orleans, Louisiana. Available online at www.nutrias.org.

Anderson, David G. and Kenneth E. Sassaman
1996 Paleoindian and Early Archaic Research in the South Carolina Area. In *The Paleoindian and Early Archaic Southeast*, edited by David G. Anderson and Kenneth E. Sassaman, pp. 222-237. University of Alabama Press, Tuscaloosa

Anonymous
n.d. Halftone reproduction of a drawing, entitled "USS *Chickasaw* (1864-1874)." Photograph # NH 51486. U. S. Naval Historical Center. Washington, D. C. Available online at www.history.navy.mil.

n.d. [ca. 1865] Photograph entitled "USS *Tennessee* (1864-1867)." Photograph # NH 60335. U. S. Naval Historical Center. Washington, D.C. Available online at www.history.navy.mil.

1866 Engraving published in the English magazine *Engineering*, July 13, 1866, p. 30, entitled "The American Monitors." Photograph # NH 95102. U. S. Naval Historical Center. Washington, D. C. Available online at www.history.navy.mil.

Aten, Lawrence E.
1984 Woodland Cultures of the Texas Coast. In *Perspectives in Gulf Coast Prehistory*, edited by Dave D. Davis, pp. 44-76. Ripley P. Bulletin Monograph in Anthropology and History No. 5. Florida State University, Gainesville.

Autin, Whitney J.
1989 *Geomorphic and Stratigraphic Evolution of the Middle Amite River Valley, Southeastern Louisiana*. Unpublished Ph.D. dissertation, Louisiana State University, Baton Rouge.

Autin, Whitney J., Scott F. Burns, Bobby J. Miller, Roger T. Saucier, and John I. Snead
1991 Quaternary Geology of the Lower Mississippi River Valley. In *Quaternary Nonglacial Geology, Conterminous U.S.*, edited by R. B. Morrison, pp. 20-56. The Geology of North America, vol. K-2. Geological Society of America, Boulder, Colorado.

Autin, Whitney J., John I. Snead, Roger T. Saucier, Scott F. Burns, and Bobby J. Miller
1990 Current Approach to Quaternary Research in the Lower Mississippi Valley. In *Field Guide to the Mississippi Alluvial Valley Northeast Arkansas and Southeast Missouri, Friends of the Pleistocene South-Central Cell 1990*, edited by M. J. Guccione and E. M. Rutledge, pp. 23-45. University of Arkansas, Fayetteville.

Bachman, John
1851 Birds' Eye View of New Orleans. A. Guerber & Co., Library of Congress (LC) Panoramic maps (2nd ed.), 240.1, LC-USZC4-2102 DLC. Available online at http://hdl.loc.gov/loc.pnp/cph.3g02102.

Baldwin, Leland
1980 *The Keelboat Age on Western Waters*. University of Pittsburgh Press, Pittsburgh.

Barry, John
1997 *Rising Tide: The Great Mississippi Flood of 1927 and How it Changed America*. Simon and Schuster, New York.

Bass, George (editor)
1996 *Ships and Shipwrecks in the Americas: A History Based on Underwater Archaeology*. Thames and Hudson, London.

Beavers, Richard C.
1977 *The Archaeological Significance of the Barataria Basin, Southeastern Louisiana*. Submitted by the Department of Anthropology and Geography, Archaeological Research Program, University of New Orleans, to the National Park Service, Jean Lafitte National Historical Park, New Orleans, Louisiana.

Beavers, Richard C., and Teresia R. Lamb
1980 *A Level II Archaeological Field Survey and Assessment Program of Pier 4 Location, Greater New Orleans Mississippi River Bridge, Orleans and Jefferson Parishes, Louisiana*. Submitted to the Louisiana Department of Transportation and Development. University of New Orleans.

Belcher, E.O., H.Q. Dihn, D.C. Lynn, and T.J. Laughlin.
1999 *Beamforming and Imaging with Acoustic Lenses in Small, High-frequency Sonars*. Proceedings of Oceans 1999 Conference, Seattle, Washington.

Bell, A. C.
1891-93 *Plan of Property Expropriated by New Levee, Broadway to Walnut, Sixth District, New Orleans, Louisiana (Drawing No. 378-A-2-4, Pine St. to Audubon Park New Levee)*. On file at the Orleans Parish Levee Board.

1894 *Plan of Property Expropriated by New Levee, Gen. Scott to Adams, Seventh District, New Orleans, Louisiana (Drawing No. 378-A-2-4, Pine St. to Audubon Park New Levee)*. On file at the Orleans Parish Levee Board

Belmont, John S.
1967 The Culture Sequence at the Greenhouse Site, Louisiana. *Southeastern Archaeological Conference Bulletin* 6:27-35.

Bezou, Henry C., Monsignor
1973 *Metairie: A Tongue of Land to Pasture.* Pelican Publishing Company. Gretna, Louisiana.

Bisso Marine, Inc.
2003 Available online at www.bissomarine.com.

Bisso Towboat, Inc.
2003 "History of Bisso Towing Company." Available online at www.bissotowboat.com

Bisso, Beau
2003 Bisso Marine Co. Inc., personal communication, August 4, 2003.

Bisso, William A. (Cappy), III
2003 President, Bisso Marine Co. Inc., personal communication, August 22, 2003 and October 13, 2003.

Blitz, John H.
1993 Locust Beads and Archaic Mounds. *Mississippi Archaeology* 28(1):20-43.

Britsch, Louis D., and Joseph B. Dunbar
1990 *Geomorphic Investigation of Davis Pond, Louisiana.* U.S. Army Corps of Engineers Waterway Experimental Station Technical Report No. GL-90-12. U.S. Army Corps of Engineers Waterways Experimental Station, Vicksburg.

Brose, David S.
1979 A Speculative Model of the Role of Exchange in the Prehistory of the Eastern Woodlands. In *Hopewell Archaeology*, edited by D. Brose and N. Greber, pp. 3-8. Kent State University Press, Kent, Ohio.

Brown, Ian W.
1984 Late Prehistory in Coastal Louisiana. In *Perspectives on Gulf Coast Prehistory* edited by Dave D. Davis pp. 94 - 124, Ripley P. Bulletin Monograph in Anthropology and History No. 5 Florida State University, Gainesville.

Bruseth, James E.
1991 Poverty Point Development as Seen at the Cedarland and Claiborne Sites, Southern Mississippi. In *The Poverty Point Culture: Local Manifestations, Subsistence Practices, and Trade Networks.* p.7-25, Edited by Kathleen M. Byrd, Geoscience & Man 29, Louisiana State University.

Brush, Nigel and Forrest Smith
1994 The Martins Creek Mastodon: A Paleoindian Butchery Site in Holmes County, Ohio. *Current Research in the Pleistocene* 11:14-16.

Burke, John
1990 "1938 Last of Rail Ferries Saw Action During Civil War." *New Orleans Times-Picayune*, December 9, 1990, Section F, p. 16.

Bush, Robert D., (editor)
1978 *Memoirs of My Life...During the Years 1803 and After.* Translated by Agnes-Josephine Pastwa. Published for the Historic New Orleans Collection by Louisiana State University Press. Baton Rouge.

Butler, Benjamin F.
1892 *Autobiography and Personal Reminiscences of Major General Benjamin F. Butler: Butler's Book.* A. M. Thayer, Boston.

1917 *Private and Official Correspondence of Gen. Benjamin F. Butler, During the Period of the Civil War.* The Plimpton Press, Norwood, Massachusetts.

Campanella, Richard
2002 *Time and Place in New Orleans: Past Geographies in the Present.* Pelican Publishing Company. Gretna, Louisiana.

Campbell, L. Janice, James R. Moorehead, and A. Frank Servello
1990 *Data Recovery at 16VN791, a Multi-Component Prehistoric Site in the Birds Creek Drainage Fort Polk Military Reservation Fort Polk, Louisiana.* New World Research, Inc. Submitted to the U.S. Department of the Interior, National Park Service, Atlanta, Georgia.

Cangelosi, Robert J., and Dorothy G. Schlesinger (editors)
1996 *New Orleans Architecture. Volume VIII: The University Section, Joseph Street to Lowerline, Mississippi River to Walmsley Avenue.* Pelican Publishing Company. Gretna, Louisiana.

Cantley, Charles E., John Kern, Edwin Jackson, Joseph Schuldenrein, and Nancy Bernstein
1984 *Cultural Resources Evaluations at Fort Polk, Louisiana.* Gilbert/Commonwealth, Inc. Submitted to Interagency Archeological Services-Atlanta National Park Service, Contract No. CX5000-3-1094.

Casey, Powell A.
1983 *Encyclopedia of Forts, Posts, Named Camps, and Other Military Installations in Louisiana, 1700-1981.* Claitor's Publishing Division, Baton Rouge, Louisiana.

Catton, Bruce
1960 *Picture History of the Civil War.* American Heritage/Bonanza Books, New York.

Chapelle, Howard
1935 *The History of American Sailing Ships.* Bonanza Books, New York

Chase, John Churchill
1979 *Frenchmen, Desire, Good Children, and Other Streets of New Orleans.* Third Edition. Macmillan Publishing Company. New York, New York.

Clancey, Patrick
2003 Patrol Craft. *Ships of the U.S. Navy, 1940-1945.* HyperWar Foundation, http://www.ibiblio.org/hyperwar/USN/ships/ships-pg.html#pf. (10 December 2003).

Clausen, Carl J., A. D. Cohen, Cesare Emiliani, J. A. Holman, and J. S. Stipp
1979 Little Salt Spring, Florida: A Unique Underwater Site. *Science* 203:609-614.

Clay, Floyd
1976 *A Century on the Mississippi: A History of the Memphis District U. S. Army Corps of Engineers 1876-1976*. U. S. Army Corps of Engineers, Memphis District, Memphis.

Clune, John, and Karla W. Wheeler (compilers)
1991 *A Database of Louisiana Shipwrecks*. Database on file at the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge.

Coleman, James M.
1982 *Deltas - Processes of Deposition and Models for Exploration*. International Human Resources Development Corporation, Boston.

Coleman, James M., and Sherwood M. Gagliano
1964 Cyclic Sedimentation in the Mississippi River Deltaic Plains. *Transactions of the Gulf Coast Association of Geological Societies* 14:67-40.

Coleman, J. M., and H. H. Roberts
1988 Sedimentary Development of the Louisiana Continental Shelf Related to Sea Level Cycles: Part I. *Sedimentary Sequence: Geo-Marine Letters* 8:63-108.

Conrad, Glenn R. (editor)
1988 *A Dictionary of Louisiana Biography. Vol 1*. Louisiana Historical Association, New Orleans.

Cornish, Dudley T.
1956 *The Sable Arm: Negro Troops in the Union Army, 1861-1865*. Longmans, Green & Co., New York.

Craig, Nancy J., Latimore M. Smith, Nelwyn M. Gilmore, Gary D. Lester, and Alanea M. Williams
1987 *The Natural Communities of Coastal Louisiana Classification and Description*. Coastal Management Division, Louisiana Department of Natural Resources, Baton Rouge.

Cridelbaugh, George S.
n.d. "Bridges and Tunnels of Alleheny County, PA," photograph, Carnegie Library of Pittsburgh, available online at http://freepages.history.rootsweb.com/~jmohney/brownsville_packet_line.htm

Cummins, Light T.
1990 Toward Unknown Destinies: Native Peoples and Explorations. *Louisiana: A History,* Arlington Heights, Ill. pp. 7.

Currier & Ives
1885 The city of New Orleans, and the Mississippi River Lake Pontchartrain in distance. Currier & Ives, New York, (LC) Panoramic maps (2nd ed.), 240.1, PGA - Currier & Ives--City of New Orleans. Available online at http://hdl.loc.gov/loc.pnp/cph.3f04911.

David Rumsey Historical Map Collection
2003 The World's Industrial And Cotton Centennial Exposition, New Orleans, La., U.S.A. Department of Installation. Plan No. 2 Map Of The City Of New Orleans Showing Location Of Exposition Grounds And All Approaches Thereto By Land & Water. C.A. Burke, Director General. Sam Mullen, Chief Of Department. Southern Lithc. Co. 38 Natchez St. N.O. (with 6 inset views and maps). Available online at www.davidrumsey.com.

Davis, Edwin A.
1971 *Louisiana, A Narrative History*. 3rd ed. Claitor's Publishing Division, Baton Rouge.

Duhe, Brian J.
1976 Preliminary Evidence of a Seasonal Fishing Activity at Bayou Jasmine. *Louisiana Archaeology* 3:33-74.

Dupre, Rueben
2003 Supervisor, Bisso Towboat Company, personal communication, August 4, 2003.

Dye, David H., and Cheryl Anne Cox (editors)
1990 *Towns and Temples Along the Mississippi*. University of Alabama Press, Tuscaloosa

Ebony Magazine
1972 "Two Cities Pay Tribute to Mahalia Jackson: Death Ends 45-year career of 'World's Greatest Gospel Singer' (April 1972). Available online at http://www.geocities.com/BourbonStreet/2675/ebony/ebony.html.

Elliot, D.O.
1932 *The Improvement of the Lower Mississippi River for Flood Control and Navigation.* Volume III, U.S. Waterways Experiment Station, Vicksburg, Mississippi.

Ensor, H. Blaine
1986 San Patrice and Dalton Affinities on the Central and Western Gulf Coastal Plain. *Bulletin of the Texas Archeological Society* 57:69-81.

Farragut, David G.
1865 Drawing entitled "Entrance of Rear Admiral Farragut in to Mobile Bay. August 5th 1864." Photograph # NH 83136. U. S. Naval Historical Center. Washington, D. C. Available online at www.history.navy.mil.

Farrell, Brenna
2001 The Buffalo Soldiers: Forgotten Heroes of the West. Available online at http://home.inreach.com/kfarrell/buffalosoldiers.html.

Feuge, Reuben M.
2003 Personal communication, October 14, 2003

Fike, Richard E.
1987 *The Bottle Book: A Comprehensive Guide to Embossed Medicine Bottles*. Gibbs M. Smith, Peregrine Smith Books, Salt Lake City.

Fisk, Harold N.
1943 *Summary of the Geology of the Lower Alluvial Valley of the Mississippi River.* Louisiana State University, Baton Rouge.

1960 Recent Mississippi River Sedimentation and Peat Accumulation. In *Congres Pour L'advancement des Etudes de Stratigraphie et de Geologie du Carbonifere*, 4th Heerlen, edited by Van Aelst, pp. 189-199, Compte rendu, Maastrict, Netherlands.

Florence, Gene
1990 *The Collector's Encyclopedia of Depression Glass.* Collector Books, Paducah, Kentucky

Ford, James A.
1951 Greenhouse: A Troyville-Coles Creek Period Site in Avoyelles Parish, Louisiana. *Anthropological Papers of the American Museum of Natural History* 44, Part 1.

Ford, James A., and G. I. Quimby, Jr.
1945 *The Tchefuncte Culture, an Early Occupation of the Lower Mississippi Valley.* Memoirs of the Society for American Archaeology, No. 2. Menasha, Wisconsin.

Ford, James A., and Clarence H. Webb
1956 Poverty Point, A Late Archaic Site in Louisiana. *American Museum of Natural History, Anthropological Papers* 46(1).

Forman, L. Ronald and Joseph Logsdon
1985 *Audubon Park: An Urban Eden.* Audubon Park Press, New Orleans.

Fort Leavenworth
2003 Available online at http://leav-www.army.mil/pao/buffalo.

Fortier, Alcée, (editor)
1914 *Louisiana: Comprising Sketches of Parishes, Towns, Events, Institutions, and Persons, Arranged in Cyclopedic Form (volume 3).* Century Historical Association, New Orleans.

Franks, Herschel A. and Jill-Karen Yakubik
1991 *Archaeological Survey of Square 509 (16 OR135), Orleans Parish, Louisiana, for the United States Postal Service.* With contributions by Jeffrey Treffinger. Report submitted to the United States Postal Service, by Earth Search, Inc.

Frazier, David E.
1967 Recent Deltaic Deposits of the Mississippi River: their Development and Chronology. *Transactions of the Gulf Coast Association of Geological Societies* 17:287-315.

1974 Depositional - Episodes: Their Relationship to the Quaternary Stratigraphic Framework of the Northwestern Portion of the Gulf Basin. *Texas Bureau of Economic Geology Geological Circular* 74-1:28. Austin.

Frazier, David E., and Alex Osanik
1965 Recent Peat Deposits - Louisiana Coastal Plain. In *Environments of Coal Deposition,* edited by E. C. Dapples and M. E. Hopkins, pp. 63-85. Special Paper 114, Geological Society of America, Boulder, Colorado.

Gagliano, Sherwood M.
1963 A Survey of Preceramic Occupations in Portions of South Louisiana and South Mississippi. *Florida Anthropologist* 16(4):105-132.

1967 Occupation Sequence at Avery Island. *Coastal Studies Series* No. 22. Edited by W.G. McIntire. Louisiana State University Press, Baton Rouge.

Gagliano, Sherwood M. and Roger T. Saucier
1963 Poverty Point Sites in Southeastern Louisiana. *American Antiquity* 28:320-327.

Galloway, Carolyn
1977 Acquisitions and Early Development of New Orleans' Audubon Park. Unpublished Master's Thesis, Submitted to the University of New Orleans. University of New Orleans, New Orleans.

Gandoifo, Kuhn & Associates
ca. 1970 Scaled aerial photo of the Carrollton Bend area. Produced by the Office of Gandoifo, Kuhn & Associates, Civil Engineers & Land Surveyors, New Orleans. On file in the personal collection of William A. Bisso, III, at Bisso Marine Company.

Gandy, J., and Gandy, T.
1987 *The Mississippi Steamboat Era in Historic Photographs: Natchez to New Orleans 1870-1920.* Dover Publications Inc., New York.

Gardiner, Robert (editor)
1992 *The Heyday of Sail.* Conway's History of the Ship. Conway Maritime Press, London.

1993 *The Advent of Steam: The Merchant Steamship before 1900.* Conway's History of the Ship. Conway Maritime Press, London.

Garrison, Ervan G., F. Paul Rushmore, Terry L. Jones, James R. Caldwell, and Robert E. Murry, Jr.
1981 *A Final Report on Archaeological Test Excavations of Two Nineteenth Century Well Sites at Lucy Revetment, Louisiana.* Submitted by the Cultural Resources Laboratory, Texas A&M University, to the U.S. Army Corps of Engineers, New Orleans District, Louisiana.

Giardino, Marco J.
1984 Documentary Evidence for the Location of Historic Indian Villages in the Mississippi Delta. In *Perspectives in Gulf Coast Prehistory*, edited by Dave D. Davis, pp. 232-249, Ripley P. Bulletin Monograph in Anthropology and History No. 5. Florida State University, Gainesville

Gibson, Jon L., and J. Richard Shenkel
1988 Louisiana Earthworks: Middle Woodland and Predecessors. *In Middle Woodland Ceremonialism in the Mid-South and Lower Mississippi Valley*. Proceedings of the 1984 Mid-South Archaeological Conference, pp. 7-18. Mississippi Department of Archives and History, Jackson.

Gibson, Jon L.
1974 The Rise and Decline of Poverty Point. *Louisiana Archaeology*, No. 1:8-36.

1978 *Cultural Resources Survey of LL&E Realignment and Clovelly Farms, Lafourche Parish, South Louisiana.* Report prepared for the U.S. Army Corps of Engineers, New Orleans District.

1982 *Archeology and Ethnology on the Edges of the Atchafalaya Basin, South Central Louisiana.* Submitted by the author to the U.S. Army Corps of Engineers, New Orleans District.

Goodwin, R. Christopher, and Kenneth Jones
1986 *Cultural Resources Investigations and Assessment of the Mound City Shipyard and Marine Ways (11 PU 140), Pulaski County, Illinois.* R. Christopher Goodwin & Associates, Inc., New Orleans, Louisiana. Submitted to the U.S. Army Corps of Engineers, Memphis District, Memphis, Tennessee.

Goodwin, R. Christopher, Jill-Karen Yakubik, Peter A. Gendel, Kenneth Jones, Debra Stayner, Cyd H. Goodwin, Galloway W. Selby, and Janice Cooper
1984 *Preserving the Past for the Future: A comprehensive Archeological and Historic Site Inventory of Jefferson Parish, Louisiana.* Submitted to the Department of Culture, Recreation, and Tourism. Jefferson Parish Historical Commission, Metairie, Louisiana.

Goodwin, R. Christopher, Paul V. Heinrich, William P. Athens, and Stephen Hinks
1991 *Overview, Inventory, and Assessment of Cultural Resources in the Louisiana Coastal Zone*. Submitted by R. Christopher Goodwin & Associates, Inc., for Contract SFP No. 25101-90-09, Coastal Management Division, Department of Natural Resources, Baton Rouge.

Goreau, Laurraine
1975 *Just Mahalia, Baby.* Word Books, Waco, Texas.

Green, Jeremy
1990 *Maritime Archaeology: A Technical Handbook*. Academic Press, New York.

Greene, Jerome A.
1982 *The Defense of New Orleans, 1718-1900: Jean Lafitte National Historical Park.* National Park Service, Denver.

Guilbeau, J. L.
n.d. *The St. Charles Streetcar, or the New Orleans and Carrollton Rail Road.* Published by the author, New Orleans.

Gurke, Karl
1987 *Bricks and Brickmaking*. The University of Idaho Press, Moscow, Idaho.

Guy, John and J. Gunn
1983 Settlement Pattern Hypothesis for West Central Louisiana. Manuscript on file.

Haag, William G.
1971 *Louisiana in North American Prehistory*. Melanges 1. Louisiana State University, Baton Rouge.

Hall, E., T.
1970 Survey Techniques in Underwater Archeology. *Philosophical Transactions of the Royal Society*, London A.269:121-124.

Hall, Gwendolyn Midlo
1992 *Africans in Colonial Louisiana: The Development of Afro-Creole Culture in the Eighteenth Century*. Louisiana State University Press, Baton Rouge.

Higgins, Archie
2003 Former president, E. N. Bisso and Son, Inc.

Hillman, M.
1985 Paleoindian Settlement on the Macon Ridge, Northeastern Louisiana. *Louisiana Archaeology* 12:203-218.

1990 Paleoindian Settlement on the Macon Ridge, Northeastern Louisiana. *Louisiana Archaeology* 12:203-218.

Hinks, Stephen, Paul. V. Heinrich, Ralph Draughon, Jr., Susan Barrett Smith, Jennifer Cohen and William P. Athens
1993 *Cultural Resource Survey of Carrollton Bend Revetment, Mississippi River M-105.7 to 101.7-L, Jefferson and Orleans Parishes, Louisiana*. Report submitted to the U.S. Army Corps of Engineers, New Orleans District.

Howell, William S.
2002 Photographic Collection. Orleans Parish Public Library, City Archives Division. New Orleans, Louisiana. Available online at www.nutrias.org.

Hudson, Charles
1978 *The Southeastern Indians*. The University of Tennessee Press.

Hughes, Nathaniel C.
1997 *The Pride of the Confederate Artillery : The Washington Artillery in the Army of Tennessee*. Louisiana State University Press. Baton Rouge, Louisiana.

Hunt, C. H.
1974 *Natural Regions of the United States and Canada*. W. H. Freeman and Company, San Francisco.

Hunter, Louis
1993 *Steamboats on the Western Rivers: An Economic and Technological History*. Dover Publications, Inc., New York.

Hutcheson, Grote
1897 The Ninth Regiment of Cavalry. In *The Army of the United States: Historical Sketches of Staff and Line with Portraits of Generals-in-Chief,* edited by Theophilus F. Rodenbough and Willaim F. Haskin, pp. 280-287. Maynard, Merrill & Co. New York. Available online at www.loc.gov.

International Museum of the Horse
1996 "Buffalo Soldiers on the Western Frontier." Available online at www.imh.org/imh/buf/buf2.html.

Irion, Jack B., Ralph Draughon, Jr., Paul V. Heinrich, and Jennifer Cohen
1994 *Phase I Investigation of 1820, 1828, and 1838 Calhoun Street, Square 97, Uptown Area, New Orleans, Louisiana*. Submitted to the Loyola University Physical Plant, New Orleans.

Irvin, Hillary Somerville
1997 The Foucher Tract. In *New Orleans Architecture. Volume VIII: The University Section, Joseph Street to Lowerline, Mississippi River to Walmsley Avenue*, edited by Robert J. Cangelosi and Dorothy Schlesinger. Pp. 39-64. Pelican Publishing Company. Gretna, Louisiana.

Jackson, H. E.
1986 *Sedentism and Hunter-Gatherer Adaptations in the Lower Mississippi Valley: Subsistence Strategies during the Poverty Point Period.* Ph.D. dissertation, University of Michigan. Ann Arbor: University Microfilms.

1991 Bottomland Resources and Exploitation Strategies during the Poverty Point Period: Implications of the Archaeobiological Record from the J. W. Copes Site. In *The Poverty Point Culture: Local Manifestations, Subsistence Practices, and Trade Networks*, edited by Kathleen M. Byrd, pp. 131-157. Geoscience and Man vol. 29. Louisiana State University.

Jackson, Mahalia, with Evan McLeod Wylie
1966 *Mahalia Jackson with Evan McLeod Wylie.* Hawthorne Books, Inc. New York.

Jenkins, Ned J.
1974 Subsistence and Settlement Patterns in the Western Middle Tennessee Valley during the Transitional Archaic-Woodland Period. In *Journal of Alabama Archaeology* 20:183-193.

Jenkins, Ned J., and Richard A. Krause
1986 *The Tombigbee Watershed in Southeastern Prehistory*. University of Alabama Press, University of Alabama.

Jeter, Marvin D., Jerome C. Rose, G. Ishmael Williams, Jr., and Anna M. Harmon
1989 *Archeology and Bioarcheology of the Lower Mississippi Valley and Trans Mississippi South in Arkansas and Louisiana. Arkansas Archeological Survey Research Series No. 37.* Final Report Submitted to the U.S. Army Corps of Engineers, Southwestern Division Study Unit 6 of the Southwestern Division of Archeological Overview. Contract No. DACW63-84-C-0149.

Jeter, Marvin D., and G. Ishmael Williams, Jr.
1989 Environmental Setting and Variability. In *Archeology and Bioarcheology of the Lower Mississippi Valley and Trans-Mississippi South in Arkansas and Louisiana*, edited by Marvin D. Jeter, G. Ishmael Williams, Jr., and Anna H. Harmon, pp. 3-17, Arkansas Archeological Survey Research Series No. 37, Arkansas Archeological Survey, Fayetteville.

Jones, Olive and Catherine Sullivan
1989 *The Parks Canada Glass Glossary.* Revised Edition. Studies in Archaeology, Architecture, and History, National Historic Parks and Sites Branch. Parks, Canada.

Kelman, Ari
2003 *A River and Its City: The Nature of Landscape in New Orleans.* University of California Press. Berkeley, California.

Kemp, Peter (editor)
1976 *The Oxford Companion to Ships and the Sea.* Oxford University Press, Oxford, New York, Melbourne.

Kenner, Charles L.
1999 *Buffalo Soldiers and Officers of the Ninth Cavalry, 1867-1898.* University of Oklahoma Press. Norman, Oklahoma.

Kidder, Tristram R.
1995 *Archaeological Data Recovery at 16JE218, Jefferson Parish, Louisiana.* Cultural Resources Series Report No. COELMN/PD-95/03. Earth Search, Inc., New Orleans.

Kniffen, Fred B., Hiram F. Gregory, and George A. Stokes
1987 *The Historic Indian Tribes of Louisiana, from 1542 to the Present.* Louisiana State University Press, Baton Rouge.

Knight, Vernon J., Jr.
1984 *Late Prehistoric Adaptation in the Mobile Bay Region.* Perspectives on Gulf Coast Prehistory, University Presses of Florida, Gainesville, Florida.

Koch, Augustus
1876 *Birds' eye view of Jacksonville, Fla.* Alvord, Kellog & Campbell, Library of Congress (LC) Panoramic maps (2nd ed.), 113, G3934.J2A3 1876 .K6. Available online at http://hdl.loc.gov/loc.gmd/g3934j.pm001130.

Kolb, Charles R.
1962 *Distribution of Soils Bordering the Mississippi River from Donaldsonville to the Head of Passes*. U.S. Army Corps of Engineers Waterways Experimental Station Technical Report 3-601. U.S. Army Corps of Engineers Waterways Experimental Station, Vicksburg.

1963 Sediments Forming the Bed and Banks of the Lower Mississippi River and Their Effects on River Migration. *Sedimentology* 2:227-234.

Kolb, Charles R., and Roger T. Saucier
1982 Engineering Geology of New Orleans. In *Geology Under Cities*, edited by R. F. Legget, pp. 75-93. Reviews in Engineering Geology No. 5. Geological Society of America, Boulder, Colorado.

Kolb, Charles R., Fred L. Smith, and Robert C. Silva
1975 *Pleistocene Sediments of the New Orleans/Lake Pontchartrain Area*. U.S. Army Corps of Engineers Waterways Experimental Station Technical Report S-75-6. U.S. Army Corps of Engineers Waterways Experimental Station, Vicksburg.

Kolb, Charles R., and Jack R. Van Lopik
1958 *Geology of the Mississippi River Deltaic Plain, Southeastern Louisiana*. U.S. Army Corps of Engineers Waterways Experimental Station Technical Report 3-483. U.S. Army Corps of Engineers Waterways Experimental Station, Vicksburg.

1966 Depositional Environments of the Mississippi River Deltaic Plain. In *Deltas in Their Geologic Framework*, edited by M. L. Shirley and J. R. Ragsdale, pp. 17-62. Houston Geological Society, Houston.

Kovel, Ralph and Terry Kovel
1986 *Kovels' New Dictionary of Marks*. Crown Publishers, Inc., New York.

Kuttruff, Carl
1975 The Poverty Point Site: North Sector Test Excavations. *Louisiana Archaeology* (2):129-151.

Ledet, Wilton P.
1938 The History of the City of Carrollton. In *Louisiana Historical Quarterly* 21(2): 220-281.

Lehner, Lois
1988 *Lehner's Encyclopedia of U.S. Marks on Potter, Porcelain, and Clay*. Collector Books, Paducah, Kentucky

Library of Congress
2001 Photographic Collection. Available online at www.loc.gov.

Lipfert, Nathan R.
2003 Library Director, Maine Maritime Museum, Library Director, personal communication, October 24, 2003.

List of Merchant Vessels of the United States.
1905 Department of Commerce and Labor, Bureau of Navigation, United States Government Printing Office: Pg 6.

Lopez, John A.
1991 Origin of Lake Pontchartrain and the 1987 Irish Bayou Earthquake. In *Coastal Depositional Systems in the Gulf of Mexico, Quaternary Framework and Environmental Issues*, pp. 103-110. Gulf Coast Section Society of Economic Paleontologists and Mineralogists Foundation, Houston.

Louisiana Division, Orleans Parish Public Library
2001 Photographic collections. Available online at www.nutrias.org.

Louisiana Railroad Museum
2003 "Southern Railroading History" Accessed October 8, 2003 at http://www.railroadmuseum.org/southernhistory.

Louisiana Secretary of State
2003 *Commercial Division: Corporations Database.* www.sec.state.la.us/crpinq.htm (22-23 September 2003).

Lowery, G. H.
1974a *The Mammals of Louisiana and Its Adjacent Waters*. Louisiana State University Press, Baton Rouge.

1974b *Louisiana Birds*. Louisiana State University Press, Baton Rouge.

Lucy, Gary
n.d. Painting, courtesy of the Old Glory Gallery and Frame Shoppe Accessed on November 6, 2003, at http://www.oldgloryprints.com/mainmenu.htm.

Magill, John Tylden
1990 The Freeze of 1899. *The Historic New Orleans Collection Newsletter* 8(4):6-7.

Mahé, John A., II
1976 *The Development of a Town at Carrollton, Louisiana.* Master's Thesis, Tulane University. Louisiana Collection, Howard-Tilton Library. Tulane University. New Orleans, Louisiana.

Mansberger, Floyd
1986 Changing Patterns in Nineteenth Century Ceramics. In *Nineteenth Century Historic Archaeology in Illinois*, edited by Thomas E. Emerson and Charles L. Rohrbaugh, pp. 131-179. Illinois Cultural Resources Study 2, Illinois Historic Preservation Agency, Springfield

Mason, Ronald J.
1962 The Paleo-Indian Tradition in Eastern North America. *Current Anthropology* 3:227-278.

Master Lock
2003 *The Master Lock Story* Accessed September 19, 2003 http://www.masterlock.com/meetml/history.shtml.

Miller, George L.
1980 Classification and Economic Scaling of 19th Century Ceramics. *Historical Archaeology.* 14:1-40. Society for Historical Archaeology.

1991 A Revised Set of CC Index Values for Classification and Economic Scaling of English Ceramics from 1787 to 1880. In *Historical Archaeology.* Volume 25, pp. 1-25.

Miller, William III
1983 Stratigraphy of Newly Exposed Quaternary Sediments, Eastern Orleans Parish, Louisiana. *Tulane Studies in Geology and Paleontology* 17:85-104.

Mississippi River Commission (MRC)
1883 [1893-1894] *Survey of the Mississippi River, Chart No. 75.* Maps on file, Mississippi River Commission, Vicksburg District.

1913-1915 *Survey of the Mississippi River, Chart No. 69.* Maps on file, Mississippi River Commission, Vicksburg District.

1920 *Survey of the Mississippi River, Chart No. 76.* Maps on file, U.S. Army Corps of Engineers, New Orleans District.

Möellhausen, Balduin
1845 *Norman's Plan of New Orleans & Envirions, 1845.* B.M. Norman Publisher. Library of Congress, G4014.N5 1845 .M6 TIL. Available online at http://hdl.loc.gov/loc.gmd/g4014n.ct000243

Mohney, Jay W.
2003 Steamboat Building in Elizabeth, PA. Accessed on November 13, 2003 at http://freepages.history.rootsweb.com/~jmohney

Moore, William S.
1982 Late Pleistocene Sea Level History. In *Uranium Series Disequilibrium: Application to Environmental Problems*, edited by M. Ivanovich and R. S. Harmon, pp. 481-496. Clarendon Press, Oxford, England.

Mugnier, George Francis
2002 Photographic Collection. Orleans Parish Public Library, City Archives Division. New Orleans, Louisiana. Available online at www.nutrias.org.

Muller, Jon
1978 The Southeast. In *Ancient North Americans*, edited by J. D. Jennings, pp. 373-420. W. H. Freeman and Company, New York.

1983 The Southeast. In *Ancient North Americans*, edited by Jesse D. Jennings, pp. 372-419. Freeman, San Francisco

Munsey, Cecil
1970 *The Illustrated Guide to Collecting Bottles.* Hawthorn Books, Inc., New York.

n.a.
2003 *Patrol Craft.* Ships of the U.S. Navy, 1940-1945. http://www.ibiblio.org/hyperwar/USN/ships/ships-pg.html#pf.

2003 *PC Patrol Craft of World War II.* http://members.aol.com/wveigele/pcraft/pcraft.htm

National Park Service
1995 *National Register Bulletin 24: Guidelines for Local Surveys: A Basis for Preservation Planning.*

National Register Bulletin
2000 Guidelines for Evaluating and Registering Archeological Properties. *National Register Bulletin 15.* U.S. Department of the Interior, National Park Service, Nation Register, History and Education.

n.d. How to Apply the National Register of Criteria for Evaluation. *National Register Bulletin 36.* U.S. Department of the Interior, National Park Service, Nation Register, History and Education.

National Transportation Safety Board (NTSB)
1978 *Marine Accident Report: French Tankership SS Sitala Collision with Moored Vessels New Orleans, Louisiana July 28, 1977.* National Transportation Safety Board, Washington, D.C.

Neitzel, Robert S., and J. Stephen Perry
1977 *A Prehistory of Central and North Louisiana.* Submitted to The Research Institute, Northeast Louisiana University, Monroe.

1978 *A Prehistory of Central North Louisiana.* Submitted to the Research Institute, Northeast Louisiana University, Monroe.

Nelson, Lee H.
1968 *Nail Chronology as an Aid to Dating Old Buildings.* American Association for State and Local History, Technical Leaflet 15, History News 24(11).

Neuman, Robert W.
1976 *Atchafalaya Basin Archaeological Survey.* Unpublished report on file at the Louisiana Division of Archaeology and Historic Preservation, Department of Culture, Recreation, and Tourism, Baton Rouge.

1984 *An Introduction to Louisiana Archaeology.* Louisiana State University Press, Baton Rouge.

New Orleans Daily Picayune
1891 September 19, 1891.

1952 October 2, 1952

New Orleans Public Library
2003 New Orleans Building Plans: Street names beginning with letters A-B. Extracted from *City Archives and Special Collections: Index to Building Plans.* www.nutrias.org/~nopl (19 September 2003).

New Orleans Radio
2003 *New Orleans Nostalgia.* www.neworleansradio.com/neworleans.asp (19 September 2003).

New Orleans States-Item
1948 October 27, 1948:12, column 2-5

New Orleans Times-Democrat
1891 July 30, 1891.

1892 December 9, 1892.

Newton, Milton B., Jr.
1987 *Louisiana, A Geographical Portrait.* 2nd edition. Geoforensics, Baton Rouge.

Nixon, Richard M.
1972 "Statement on the Death of Mahalia Jackson," from the Public Papers of Richard M. Nixon, January 27, 1972. Richard Nixon Library and Birthplace, available online at www.nixonfoundation.org.

North American Commission on Stratigraphic Nomenclature
1983 North American Stratigraphic Code. *American Association of Petroleum Geologists Bulletin* 67:841-875.

Old Glory Gallery and Frame Shoppe
2003 Accessed on November 6, 2003, at http://www.oldgloryprints.com/mainmenu.htm

Otvos, Ervin G.
1973 *Geology of the Mississippi-Alabama Coastal Area and Nearshore Zone, New Orleans Geological Society 1973 Field Trip.* New Orleans Geological Society, New Orleans.

1978 New Orleans-South Hancock Holocene Barrier Island Trends and Origins of Lake Pontchartrain. *Transactions Gulf Coast Association of Geological Societies* 28:337-355.

Palmieri, Michael
2001 *Railroad Ferries in Louisiana.* Louisiana Railroad Museum, Accessed on October 31, 2003 at http://lrs.railspot.com/h/h-ferries.htm.

Pearson, Charles E., George J. Castille, Donald Davis, Thomas E. Redard, and Allen R. Saltus
1989 *A History of Waterborne Commerce and Transportation within the U.S. Army Corps of Engineers New Orleans District and an Inventory of known Underwater Cultural Resources.* Submitted by Coastal Environments, Inc. to the Louisiana Division of Archaeology, Department of Culture, Recreation, and Tourism, Baton Rouge. Baton Rouge.

Pearson, Charles E., David B. Kelley, Richard A. Weinstein, and Sherwood M. Gagliano
1986 *Archaeological Investigations on the Outer Continental Shelf: A Study within the Sabine River Valley, Offshore Louisiana and Texas*. Submitted by Coastal Environments, Inc., to Mineral Management Services, U.S. Department of the Interior, New Orleans. Contract No. 14-12-0001-30072.

Peebles, Christopher and Susan M. Kus
1977 Some Archaeological Correlates of Ranked Societies. *American Antiquity* 42:421-448.

Peebles, Christopher S., and Cyril B. Mann, Jr.
1983 Culture and Chronology in the Lubbub Creek Archaeology Locality. In *Excavations in the Lubbub Creek Archaeological Locality*, edited by C. S. Peebles, pp. 64-78, vol. 1, Prehistoric Agricultural Communities in West Central Alabama. Submitted to the U.S. Army Corps of Engineers, Mobile District.

Penfound, W. T., and E. S. Hathaway
1938 *Plant Communities in the Marshlands of Southeastern Louisiana.* Ecological Monographs 8:1-56.

Penland, Shea, John R. Suter, and Ron Boyd
1985 Barrier Islands Arcs along Abandoned Mississippi River Deltas. *Marine Geology* 63:197-233.

Penland, Shea, John R. Suter, and Randolph A. McBride
1987 Delta Plain Development and Sea Level History in the Terrebonne Parish Region, Louisiana. In *Coastal Sediments*, pp. 1689-1705. American Society of Civil Engineers.

Perrilloux, Edgar A.
1943 *Carrollton Centennial: 1845-1945.* Louisiana Collection, Howard-Tilton Library. Tulane University. New Orleans, Louisiana.

Persac, Marie Adrien
1858 *Norman's Chart of the Lower Mississippi River*. B.M. Norman Publisher. Library of Congress, G4042.M5G46 1858 .P4. Available online at http://hdl.loc.gov/loc.gmd/g4042m.ct000765.

Peters, Allyson and Andrew Beall
2002 Environmental Atlas of the Lake Pontchartrain Basin. United States Geological Service, available online at http://pubs.usgs.gov/of/2002/of02-206/phy-environment/climate.html.

Phillips, Philip
1970 *Archaeological Survey of the Lower Yazoo Basin, Mississippi, 1949-1955.* Papers of the Peabody Museum of Archaeology and Ethnology Vol. 60. Harvard University, Cambridge.

Pitot, Henry C., (editor and translator)
1979 *Observations on the Colony of Louisiana from 1796 to 1802 by James Pitot*. Baton Rouge.

Purdy, Barbara A.
1973 The Temporal and Spatial Distribution of Bone Points in the State of Florida. *Florida Anthropologist* 26:143-152.

Quimby, George I.
1951 The Medora Site, West Baton Rouge Parish, Louisiana. *Field Museum of Natural History Anthropological Series* 24(2):80-135. Publication No. 664. Field Museum of Natural History, Chicago

1957 The Bayou Goula Site, Iberville Parish, Louisiana. *Fieldiana: Anthropology* 47(2):89-170.

Ramsay, John
1947 *American Potters and Pottery.* Tudor Publishing Company, New York.

Ramsey, Karen E., and Thomas F. Moslow
1987 A Numerical Analysis of Subsidence and Sea Level Rise in Louisiana. In *Proceedings of a Conference on Advances in Understanding of Coastal Sediment Processes, Coastal Sediments '87*, edited by N. Kraus, pp. 1673-1688. American Society of Civil Engineers, Boston.

Rathje, William and Cullen Murphy
1992 *Rubbish! The Archaeology of Garbage.* HarperCollins Publishers, Inc., New York.

Reeves, S. and Reeves, W.
1990 *River Front History.* Produced for the Audubon Institute. New Orleans.

Ripley, C. Peter
1976 *Slaves and Freedmen in Civil War Louisiana.* Louisiana University Press, Baton Rouge.

Rivet, Philip G.
1973 Tchefuncte Ceramic Typology: A Reappraisal. Unpublished Master's thesis, Louisiana State University, Baton Rouge.

Ronhovde, Are
1999 High Resolution Beamforming of SIMRAD EM3000 Bathymetric Multibeam Sonar Data. Cand Scient Thesis, University of Oslo.

Ross, D. Thomas
2003 Statement before the Subcommittee on National Parks of the Senate Committee on Energy and Natural Resources, June 19, 2003. Available online at www.doi.gov/ocl/2003/s499.htm.

Saltus, Allen
1995 *Natchez Under the Hill: Historical and Archaeological Investigations of Watercraft along the Mississippi River, Adams County, Mississippi.* Prepared for Vicksburg District, U.S. Army Corps of Engineers by Coastal Environments, Inc., Baton Rouge

Samuels, Donald
2003 Safety Officer, Bisso Marine Co. Inc., personal communication, August 11, 2003.

Sanborn Map and Publishing Co., Ltd.
1909-1951 *Sanborn Fire Insurance Map of New Orleans, Volume VI.* Available online at www.nutrias.org.

Saucier, Roger T.
1963 *Recent Geomorphic History of the Pontchartrain Basin.* Louisiana State University Press, Baton Rouge.

1977 *The Northern Gulf Coast during the Farmdalian Substage: A Search for the Evidence.* U.S. Army Corps of Engineers Waterways Experimental Station Miscellaneous Paper Y-77-1. U.S. Army Corps of Engineers Waterways Experimental Station, Vicksburg.

1994 *Geomorphology and Quaternary Geologic History of the Lower Mississippi Valley.* U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Saucier, Roger T., and John I. Snead
1989 *Quaternary Geology of the Lower Mississippi River Valley*, Scale 1:1,000,000, Louisiana Geological Survey, Baton Rouge.

Saunders, Doris E. (editor)
1963 *The Day They Marched.* Johnson Publishing. Chicago, Illinois.

Saunders, Joe, Thurman Allen, and Roger T. Saucier
1992 *Preceramic? Mound Complexes in Northeast Louisiana (A Very Rough Draft).* An Unpublished Manuscript on file, R. Christopher Goodwin & Associates, Inc., New Orleans, Louisiana.

Schlesinger, Arthur (editor)
1983 *The Almanac of American History.* G.P. Putman's Sons, New York.

Schwerin, Jules
1992 *Got to Tell It: Mahalia Jackson, Queen of Gospel.* Oxford University Press. New York.

Shenkel, Richard J.
1974 Big Oak and Little Oak Islands: Excavations and Interpretations. *Louisiana Archaeology* 1:37-65.

1977 *Cultural Resource Survey of the Nashville Avenue to Napoleon Avenue Floodwall Mississippi River Levees Item M-100-L Orleans Levee District Orleans, Parish, Louisiana.* Report submitted to the U.S. Army Corps of Engineers, New Orleans District.

1980 *Oak Island Archaeology: Prehistoric Estuarine Adaptations in the Mississippi River Delta.* Submitted by the Archaeological and Cultural Research Program, University of New Orleans to the National Park Service. Contract No. PXJ7530-0-0112.

1981 Pontchartrain Tchefuncte Site Differentiation. *Louisiana Archaeology* 8:21-35.

1984 Early Woodland in Coastal Louisiana. In *Perspectives in Gulf Coast Prehistory*, edited by Dave D. Davis, pp. 41-76, Ripley P. Bulletin Monograph in Anthropology and History No. 5. Florida State University, Gainesville.

Shenkel, J. Richard, and Jon L. Gibson
1974 Big Oak Island: An Historical Perspective of Changing Site Function. *Louisiana Studies* 13(2):173-186. Natchitoches, Louisiana.

Shuman, Malcolm K.
2001 *An Evaluation of Materials Found During Construction of the Audubon Park Golf Course New Orleans, Louisiana.* Report submitted to The Audubon Nature Institute, by Surveys Unlimited Research Associates, Inc.

Simmons, Scott
1997 *Supplemental Archeological Monitoring Conducted in Response to Recommendations Made as a Result of Phase I Investigations of 1820, 1829, and 1838 Calhoun Street, in Square 97 of the Uptown Area, New Orleans, Louisiana.* R. Christopher Goodwin & Associates, Inc., New Orleans, Louisiana. Submitted to the Loyola University Physical Plant, New Orleans, Louisiana.

Smith, B. D.
1986 Archaeology of the Southeastern United States: From Dalton to de Soto, 10,500 B.P. - 500 B.P. In *Advances in World Archaeology* 5:1-92, edited by F. Wendorf and A. Close. Academic Press, New York

1987 The Independent Domestication of Indigenous Seed-Bearing Plants in Eastern North America. In *Horticultural Economies of the Eastern Woodlands*, edited by William Keegan, pp. 3-48. Southern Illinois University, Carbondale. Center for Archaeological Investigations Occasional Paper 7.

Smith, Brent W.
1975 Prehistoric Settlement Patterns of the Young's Bayou Drainage, Natchitoches Parish, Louisiana. In *Louisiana Archaeology* 2:163-200.

Smith, Lawson M., Joseph B. Dunbar, and Louis D. Britsch
1986 *Geomorphological Investigations of the Atchafalaya Basin, Area West, Atchafalaya Delta, and Terrebonne Marsh.* Geotechnical Laboratory and Coastal Engineering Research Center, U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi, Technical Report GL-86-3. Submitted to the U.S. Army Corps of Engineers, New Orleans District.

Smith, Steven D., Philip G. Rivet, Kathleen M. Byrd, and Nancy W. Hawkins
1983 *Louisiana's Comprehensive Archaeological Plan.* State of Louisiana, Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge.

Smith, Xanthus
1890 Oil Painting entitled "Battle of Mobile Bay, 5 August 1864." Photograph # KN-843. U.S. Naval Historical Center. Washington, D.C. Available online at www.history.navy.mil.

Smyth, W.
1996 *Sailor's Word Book: A Dictionary of Nautical Terms.* Conway Maritime Press, London.

Snead, John I., and Richard P. McCulloh
1984 *Geologic Map of Louisiana*. Geologic Map, 1:500,000. Louisiana Geological Survey, Baton Rouge, Louisiana.

Soard's New Orleans City Directory
1885-1926 *Soard's New Orleans City Directories*. Soard's Directory Co., New Orleans.

South, Stanley
1977 *Method and Theory in Historical Archeology*. Academic Press, New York.

Speaker, John Stuart, Joanna Chase, Carol Poplin, Herschel Franks, and R. Christopher Goodwin
1986 *Archeological Assessment of the Barataria Unit, Jean Lafitte National Historical Park*. Submitted by R. Christopher Goodwin & Associates, Inc., to the National Park Service, Southwest Region, Santa Fe.

Spier, Jerry and Linda Walker
2001 *Mississippi River Batture Study, Version 1.0*. Tulane Institute for Environmental Law and Policy. Available online at http://www.law.tulane.edu/prog/specialty/environmental/envirolaw/institute/mrbatturestudy.pdf.

Springer, James W.
1974 The Bruly St. Martin Site and Its Implications for Coastal Settlement in Louisiana. *Louisiana Archaeology* 1:75-80.

Steffy, Richard
1992 *Wooden Ship Building and the Interpretation of Shipwrecks*. Texas A&M University Press, College Station.

Steponaitis, Vincas P.
1986 Prehistoric Archaeology in the Southeastern United States, 1970 - 1985. *Annual Review of Anthropology* 15:363-404.

Stobart, John
n.d. Painting, courtesy of Scrimshaw Gallery, 30 Princess Street, Sausalito, CA, available online at http://www.scrimshawgallery.com/gallery/paintings/stobart62.shtml

Struever, Stuart, and Kent D. Vickery
1973 The Beginnings of Cultivation in the Midwest-Riverine Area of the United States. *American Anthropologist* 75:197-220.

Summers, William
2001 Yard Supervisor, E.N. Bisso and Son, Inc., personal communication, August 4, 2003.

Suter, John R., Henry L. Berryhill, and Shea Penland
1987 Late Quaternary Sea-Level Fluctuations and Depositional Sequences, Southwest Louisiana Continental Shelf. In *Sea-Level Fluctuations and Coastal Evolution*, edited by S. Nummedal, O. H. Pikley, and J. D. Howard, pp. 199-222. SEPM Special Publication No. 41. The Society for Sedimentary Geology, Tulsa.

Swanson, Betsy
1975 *Historic Jefferson Parish: From Shore to Shore*. Pelican Publishing Company. Gretna, Louisiana.

Swanton, J. R.
1946 *The Indians of the Southeastern United States*. Smithsonian Institution, Bureau of American Ethnology Bulletin 137.

Terrell, Bruce G.
1990 *Louisiana Submerged Cultural Resource Management Plan*. Department of Culture, Recreation, and Tourism, Office of Cultural Development, Louisiana Division of Archaeology, Baton Rouge, Louisiana.

Thoede, Henry J.
1976 *History of Jefferson Parish and Its People*. Distinctive Printing Company. Gretna, Louisiana.

Tiffan, Kenneth F.
2001 *Bonneville Power Administration FY 2001 Innovative Project Proposal Review*. http://www.cbfwa.org/2001/innovative/projects/22037n.doc

Toth, Edwin Alan
1977 Early Marksville Phases in the Lower Mississippi Valley: A Study of Culture Contact Dynamics. Ph.D. dissertation, Department of Anthropology, Harvard University, Cambridge

Toth, Edwin Alan
1988 *Early Marksville Phases in the Lower Mississippi Valley: A Study of Culture Contact Dynamics*. Archaeological Report 21. Mississippi Department of Archives and History Jackson, Mississippi in cooperation with The Lower Mississippi Survey, Harvard University, Cambridge.

Toulouse, Julian Harrison
1971 *Bottle Makers and Their Marks*. Thomas Nelson, Inc. Publishers, Camden , New Jersey.

1977 *Fruit Jars*. Everybodys Press, Hanover, Pennsylvania.

Trahan, Larry J.
1989 *Soil Survey of Orleans Parish, Louisiana*. U.S. Soil Conservation Service, Alexandria, Louisiana.

Treadwell, Robert C.
1955 *Sedimentology and Ecology of Southeast Coastal Louisiana*. Coastal Studies Institute Technical Report No. 6. Louisiana State University, Baton Rouge.

Tryckare, Tre
1963 *The Lore of Ships*. Holt, Rinehart and Winston, New York.

Twain, Mark [pseudonym, Clemens, Samuel]
1883[1960] *Life on the Mississippi*. Bantam Books, New York.

U.S. Secretary of the Navy [*ORN*]

1999a Part I. Statistical Data of Union and Confederate Ships: United States Vessels "A-C." In *Official Records of the Union and Confederate Navies in the War of the Rebellion*, Series II, vol. 1. CD-ROM ed. Guild Press of Indiana, Carmel. Originally published 1921, Government Printing Office, Washington, D.C.

1999b West Gulf Blockading Squadron, from January 1 to December 31, 1864. *Official Records of the Union and Confederate Navies in the War of the Rebellion*, Series I, vol. 21. CD-ROM ed. Guild Press of Indiana, Carmel. Originally published 1906, Government Printing Office, Washington, D.C.

Uncle John's Inc.

2003 Accessed on November 6, 2003 at http://www.unclejohns.com/boat/default.htm

United States Army Corps of Engineers

1893 *Annual Report of the Chief Engineer*. U.S. Army Corps of Engineers, New Orleans District, New Orleans, Louisiana.

1893-1896 *Annual Report of the Chief of Engineers, U.S.A.* U.S. Government Printing Office. Washington, D.C.

1950-1970 *Transportation Lines on the Mississippi River System and The Gulf Intercoastal Waterway*. Transportation Series 4. Prepared by the Board of Engineers for Rivers and Harbors.

ca. 1955 *New Orleans District, File No. H-26-17725/2, 5 sheets*. On file at the New Orleans District, Map Room.

United States Bureau of the Census

1900 Twelfth Federal Census. Population Schedules of the Twelfth Federal Census, New Orleans, Louisiana. Online version available at www.ancestry.com.

1910 Thirteenth Federal Census. Population Schedules of the Thirteenth Federal Census, New Orleans, Louisiana. Online version available at www.ancestry.com.

1920 Fourteenth Federal Census. Population Schedules of the Fourteenth Federal Census, New Orleans, Louisiana. Online version available at www.ancestry.com.

United States Geological Society

2003 *Environmental Atlas of Lake Ponchartrain*. http://pubs.usgs.gov/of/2002/of02-206/phy-environment/climate.html

United States Secretary of War [OR]

1997 *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies*. 128 vols. CD-ROM ed. Guild Press of Indiana, Carmel. Originally published 1880-1901, Government Printing Office, Washington, D.C.

University of New Orleans (UNO) Special Collection
1928 *War Department, U.S. Engineers Office, Second New Orleans District, Mississippi River, New Orleans Harbor, Dec. 1927 to Aug. 1928*. Collection #56, Audubon Park Commission, Portfolio 56-0:9 - "Mississippi River Batture

Veigele, William. J.
2003 *PC Patrol Craft of World War II*. http://members.aol.com/wveigele/pcraft/pcraft.htm

Waldo, J. Curtis
1879 *Illustrated Visitors' Guide to New Orleans*. Published by the Author. New Orleans, Louisiana.

Walker, Bob
2003 Email Memories. *Original New Orleans Radio Shrine.* Pg 25. www.walkerpub.com/radio_memories_email25.html (18 September 2003).

Walker, Roger G.
1984 *Facies Models.* Geoscience Canada Reprint Series 1. Geological Association of Canada, Calgary.

Waller, Benjamin I.
1976 Paleo-associated Bone Tools, Florida. Paper presented at the 28th Annual Meeting of the Florida Anthropological Society, Fort Lauderdale.

Walters, W.H. and D.B. Simons
1983 Long-Term Changes of Lower Mississippi River Meander Geometry. In *River Meandering, Proceedings of the Conference Rivers '83*, pp. 318-329. Sponsored by the Waterway, Port, Coastal and Ocean Division of the American Society of Civil Engineers. American Society of Civil Engineers, New York.

Walthall, John A.
1980 *Prehistoric Indians of the Southeast: Archaeology of Alabama and the Middle South.* The University of Alabama Press, Tuscaloosa.

Way, Frederick
1990 *Way's Steam Towboat Directory*. Ohio University Press, Athens.

1992 *Way's Packet Directory, 1848-1994*. Ohio University Press, Athens.

Webb, Clarence H.
1946 Two Unusual Types of Chipped Stone Artifacts from Northwest Louisiana. In *Bulletin of the Texas Archaeological and Paleontological Society* 17:9-17.

1968 The Extent and Content of Poverty Point Culture. *American Antiquity* 33(3):297-321.

Webb, Clarence H., Joel L. Shiner, and E. Wayne Roberts
1971 The John Pearce Site (16CD56), Caddo Parish, Louisiana. *Bulletin of the Texas Archeological Society* 42:1-49. Texas Archeological Society, Austin.

Webb, S. David, Jerald T. Milanich, Roger Alexon, and James S. Dunbar
1984 A *Bison Antiquus* Kill Site, Wacissa River, Jefferson County, Florida. *American Antiquity* 49:384-392.

Webster, Donald Blake
1971 *Decorated Stoneware Pottery of North America*. Charles E. Tuttle Company, Rutland, Vermont.

Weinstein, Richard A., and Sherwood M. Gagliano
1985 The Shifting Deltaic Coast of the Lafourche Country and Its Prehistoric Settlement. In *The Lafourche Country: The People and Its Prehistoric Settlement*, edited by P. D. Uzee, pp. 122-148, Center for Louisiana Studies, University of Southwestern Louisiana, Lafayette.

Weinstein, Richard A., and D.B. Kelley
1992 *Cultural Resources Investigation in the Terrebonne Marsh, South-Central Louisiana*. Report submitted by Coastal Environments, Inc., to the U.S. Army Corps of Engineers, New Orleans District, New Orleans.

Weinstein, Richard A., and Philip G. Rivet
1978 *Beau Mire: A Late Tchula Period Site of the Tchefuncte Culture, Ascension Parish, Louisiana*. Anthropological Report 1. State of Louisiana, Department of Culture, Recreation and Tourism, Baton Rouge.

Wells, J.
1863 *New Orleans, La. and its vicinity*. Virtue & Co., Library of Congress (LC) Panoramic maps (2nd ed.), 241, G4014.N5A3 1863 .W4. Available online at http://hdl.loc.gov/loc.gmd/g4014n.pm002410

Williams, Rudi
2003 "Buffalo Soldiers due Recognition, too," in The Bluejacket News Naval Support Activity Mid-South 62(7), available online at http://www.nsamidsouth.navy.mil/publications/bluejacket/2003/bj030220.html#stories1.

Williams, Stephen, and Jeffrey P. Brain
1983 *Excavations at the Lake George Site, Yazoo County, Mississippi, 1958-1960*. Papers of the Peabody Museum of Archaeology and Ethnology Vol. 74. Harvard University, Cambridge.

Wilson, Rex L.
1981 *Bottles on the Western Frontier*. University of Arizona Press, Tucson.

Wilson, Samuel, Jr.
1980 Architecture of Early Sugar Plantations. In *Green Fields: Two Hundred Years of Louisiana Sugar*. The Center for Louisiana Studies, University of Southwestern Louisiana. Lafayette, Louisiana.

1997 The Uptown Faubourgs. In *New Orleans Architecture. Volume VIII: The University Section, Joseph Street to Lowerline, Mississippi River to Walmsley Avenue*, edited by Robert J. Cangelosi and Dorothy Schlesinger, pp.11-38. Pelican Publishing Company. Gretna, Louisiana.

Winters, John D.
1963 [1991] The Civil War in Louisiana. Louisiana State University. Baton Rouge, Louisiana.

Woodiel, Deborah K.
1980a *Excavations at the St. Gabriel Site, Iberville Parish, Louisiana.* Report on file at Louisiana Division of Archaeology, Department of Culture, Recreation and Tourism, Baton Rouge.

Woodiel, Deborah K.
1980b *St. Gabriel: Prehistoric Life on the Mississippi.* Unpublished M.A. thesis, Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

Works Progress Administration
1938 *Survey of Federal Archives in Louisiana, 1937-38: A Record of casualties to persons and vessels on the Mississippi River, its tributaries, on lakes and other waterways of the U. S. Customs District Port of New Orleans, 1873-1924.* Photostatic copy on file at the Louisiana State Museum, New Orleans, LA.

Zellner, Bob
2003 "The March on Washington," Online interview, available at Veterans of the Civil Rights Movement, http://www.crmvet.org/info/zellner1.htm.

Zimmerman, Carolyn Jane Rhorer
1980 The Historic Development of a New Orleans Neighborhood: Burtheville. Master's Thesis (Urban Studies), University of New Orleans. New Orleans, Louisiana. Copy in Research Library, Historic New Orleans Collection, New Orleans.

PRIMARY RESOURCES CONSULTED

Acts of George C. Preot, Notary Public, New Orleans, Louisiana, March 11, 1893

Amman (Jack) Surveyors and Engineers
1960 Aerial Photographic Survey of New Orleans. Available at the Orleans Parish Public Library, City Archives Division, New Orleans, Louisiana.

Bachrach & Co., Inc.,
1963 *Appraisal of Equipment Operated by New Orleans Coal & Bisso Towboat Company (in Receivership) Showing Condition and Fair Market Value as of July 2, 1963, Vol. I.* Along with Survey Report No. 63-390, 391, 397, 400, 405. Correspondence with New Orleans Coal & Towboat Company, July 24, 1963. On file in the personal collection of William A. Bisso, III, at Bisso Marine.

Gandoifo, Kuhn & Associates
ca.1970 Scaled aerial photo of the Carrollton Bend area. Produced by the Office of Gandoifo, Kuhn & Associates, Civil Engineers & Land Surveyors, New Orleans. On file in the personal collection of William A. Bisso, III, at Bisso Marine Company.

Louisiana Division, City Archives, Orleans Parish Library, New Orleans, Louisiana

The Louisiana Postcard Collection.

The William J. Barker Collection.

The David Barrow Fischer Steamboat Collection.

Succession of William A. Bisso Sr., Civil District Court of New Orleans Docket 413-574, Division C, February 15, 1968

Louisiana Division, Orleans Parish Public Library, Building Plans, MSS K5, March 30, 1896.

Probate Inventories, 1820.

The Louisiana State Museum, at the Mint, New Orleans. Louisiana

Ship Register and Enrollments of New Orleans

ca. 1860 *Ship Register and Enrollments of New Orleans*, Volume V, 1851-1860. Manuscript on file at the Louisiana State Museum, New Orleans, LA.

Works Progress Administration

ca. 1938 *Survey of Federal Archives in Louisiana, 1937-38: A Record of casualties to persons and vessels on the Mississippi River, its tributaries, on lakes and other waterways of the U.S. Customs District Port of New Orleans, 1873-1924*. Prepared by the Works Progress Administration. Photostatic copy on file at the Louisiana State Museum, New Orleans, LA.

Personal Collection of William A. "Cappy" Bisso, III, New Orleans, Louisiana

Survey Report No. 63-390 (*Independent*)

1963 Appraisal of Equipment Operated by New Orleans Coal & Bisso Towboat Company (in Receivership) Showing Condition and Fair Market Value as of July 2, 1963, Vol. I. Prepared by Bachrach & Co. Inc., Marine Surveyors at New Orleans, Louisiana. On file in the personal collection of Cappy Bisso at Bisso Marine.

Survey Report No. 63-391 (*Mary B.*)

1963 Appraisal of Equipment Operated by New Orleans Coal & Bisso Towboat Company (in Receivership) Showing Condition and Fair Market Value as of July 2, 1963, Vol. I. Prepared by Bachrach & Co. Inc., Marine Surveyors at New Orleans, Louisiana. On file in the personal collection of Cappy Bisso at Bisso Marine.

Survey Report No. 63-397 (*Boswell*)

1963 Appraisal of Equipment Operated by New Orleans Coal & Bisso Towboat Company (in Receivership) Showing Condition and Fair Market Value as of July 2, 1963, Vol. I. Prepared by Bachrach & Co. Inc., Marine Surveyors at New Orleans, Louisiana. On file in the personal collection of Cappy Bisso at Bisso Marine.

Survey Report No. 63-400 (*Indiana*)

1963 Appraisal of Equipment Operated by New Orleans Coal & Bisso Towboat Company (in Receivership) Showing Condition and Fair Market Value as of July 2, 1963, Vol. I. Prepared by Bachrach & Co. Inc., Marine Surveyors at New Orleans, Louisiana. On file in the personal collection of Cappy Bisso at Bisso Marine.

Survey Report No. 63-405 (*Eclipse*)

1963 Appraisal of Equipment Operated by New Orleans Coal & Bisso Towboat Company (in Receivership) Showing Condition and Fair Market Value as of July 2, 1963, Vol. I. Prepared by Bachrach & Co. Inc., Marine Surveyors at New Orleans, Louisiana. On file in the personal collection of William A. "Cappy" Bisso, III, at Bisso Marine.

Historic Photograph Collection. On file in the personal collection of William A. "Cappy" Bisso, III, at Bisso Marine.

Southwest Branch of the National Archives and Records Administration, Ft. Worth, Texas

Enrollment Book No. 10 March 20, 1900 to June 30, 1905, Customhouse New Orleans.
Certificates of Enrollment and Licenses 1900-1966, RG36-N22, National Archives and Records Administration, Ft. Worth, TX.

Enrollment Book No. 12 October 1, 1907 to June 30, 1911, Customhouse New Orleans.
Certificates of Enrollment and Licenses 1900-1966, RG36-N22, National Archives and Records Administration, Ft. Worth, TX.

Enrollment Book No. 13 July 1, 1911 to June 30, 1914, Customhouse New Orleans.
Certificates of Enrollment and Licenses 1900-1966, RG36-N22, National Archives and Records Administration, Ft. Worth, TX.

Enrollment Book No. 14 July 1, 1914 to June 30, 1915, Customhouse New Orleans.
Certificates of Enrollment and Licenses 1900-1966, RG36-N22, National Archives and Records Administration, Ft. Worth, TX.

Index of Enrollments July 1, 1911 to June 30, 1928. Customhouse New Orleans.
RG41-N20, National Archives and Records Administration, Ft. Worth, TX.

Record of Enrollments from July 1, 1915 to June 30, 1922. RG36-N22, National Archives and Records Administration, Ft. Worth, TX.

Record of Enrollments from September 27, 1929 to June 30, 1932. RG36-N22, National Archives and Records Administration, Ft. Worth, TX.

Record of Enrollments from July 1, 1932 to June 30, 1937. RG36-N22, National Archives and Records Administration, Ft. Worth, TX.

Record of Enrollments from July 2, 1937 to March 29, 1941. RG36-N22, National Archives and Records Administration, Ft. Worth, TX.

Record of Endorsements of Change of Master 1923-1947, RG36/41–N9, National Archives and Records Administration, Ft. Worth, TX.

Record of Endorsements of Change of Master July 1933 to December 1941. RG36/41 –N9, National Archives and Records Administration, Ft. Worth, TX.

Record of Marine Documents Deposited January 1915 to July 1932. RG26-N14, National Archives and Records Administration, Ft. Worth, TX.

Record of Marine Documents Deposited July 1, 1932 to March 31, 1938. RG26-N14, National Archives and Records Administration, Ft. Worth, TX.

Record of Endorsements of Change of Master 1923-1947, RG36/41–N9, National
Archives and Records Administration, Ft. Worth, TX.

Record of Endorsements of Change of Master July 1933 to December 1941. RG36/41 –
N9, National Archives and Records Administration, Ft. Worth, TX.

Record of Enrollments from July 1, 1915 to June 30, 1922. RG36-N22, National Archives and Records Administration, Ft. Worth, TX.

Record of Enrollments from September 27, 1929 to June 30, 1932. RG36-N22, National Archives and Records Administration, Ft. Worth, TX.

Record of Enrollments from July 2, 1937 to March 29, 1941. RG36-N22, National Archives and Records Administration, Ft. Worth, TX.

Record of Enrollments from July 1, 1932 to June 30, 1937. RG36-N22, National Archives and Records Administration, Ft. Worth, TX.

Record of Marine Documents Deposited January 1915 to July 1932. RG26-N14, National Archives and Records Administration, Ft. Worth, TX.

University of New Orleans, Special Collections Division, New Orleans, Louisiana

War Department

1928 Map entitled "Mississippi River Batture," *U.S. Engineers Office, Second New Orleans District, Mississippi River, New Orleans Harbor, Dec. 1927 to Aug. 1928.* UNO Special Collection #56, Audubon Park Commission, Portfolio 56-0:9.

Louisiana Collection, Audubon Park Commission Collection #56.